EVOLVE
GDC>04

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game design

gdconf.com

SAN JOSE, CA
MARCH 22-26, 2004

Game industry growth is radically accelerating and ever-changing market conditions demand evolution. As risks increase, developers must adopt new methodologies and pipelines, as well as anticipate and meet skyrocketing consumer expectation. To continue to engage audiences, developers must reinvigorate existing genres and properties, and create compelling new ones.

EVOLVE.

GameDevelopers
Conference

Conference Guide

EVOLVE
GDC>04

Dear Friends,

As I'm sure you've noticed, the theme for the Game Developers Conference in 2004 is "Evolve." Evolution occurs all around us, usually in slow and gradual steps. It seems, however, that evolution in the game industry occurs at an exponential pace year over year, generation over generation.

GDC 2004 is a milestone along this evolution. In these pages, you'll find some provocative interviews and a preview of the discourse to follow in March in San Jose. I hope to see you all there.

Cheers,

Alan Yu
Director
Game Developers Conference

CONFERENCE HIGHLIGHTS

▶ **Interactive Character Design**
Tim Schafer, Doublefine Productions

▶ **Game Design: Risk and Return**
Masahiro Sakurai

▶ **The Secret of Pac-Man's Success: Making Fun First**
Toru Iwatani, Namco

▶ **Triangulation: A Schizophrenic Approach to Game Design**
Will Wright, Maxis

▶ **SOCOM II: Creating a Compelling Online Console Game**
Seth Luisi, Sony Computer Entertainment America

▶ **Destruction on a Diet**
Bruce Woodard & John Crocker, Incognito Studios

▶ **Interfacing With Hollywood: Challenges and Opportunities**
Jason Rubin, Naughty Dog, Keith Boesky, ICM Talent, Leonard Grossi, Endeavor, Charles Hirschorn, G4, Larry Shapiro, Creative Artists Agency

▶ **Procedural Shaders: A Feature Animation Perspective**
Hector Yee, PDI / DreamWorks

▶ **A Peek Behind the Shoji: Japan's Videogame Market Today**
Ryoichi Hasegawa, Sony Computer Entertainment Inc.

▶ **The Full Spectrum Warrior Camera System**
John Giors, Pandemic Studios

▶ **The Making of the Official Counter-Strike Bot**
Michael Booth, Turtle Rock Studios

▶ **The Physics-Sound System of Deus Ex: Invisible War and Thief 3**
Brian Sharp, Ion Storm

▶ **Using Verlet Integration and Constraints in a Six Degree of Freedom Rigid Body Physics Simulation**
Rick Baltman & Ron Radeztsky Jr, Rainbow Studios

KEYNOTES

PROGRAMMING
John Carmack
Founder, Owner and Lead Programmer, id Software

PRODUCTION
David Perry
Founder and President, Shiny Entertainment

GAME DESIGN
Neil Young
Vice President and Executive
in Charge of Production, Electronic Arts

BUSINESS & LEGAL
Ed Fries
Corporate Vice President, Games Publishing, Microsoft

GENERAL INTEREST
Andy House
Executive Vice President of Third-Party Relations and
Marketing, Sony Computer Entertainment America

VISUAL ARTS
John Gaeta
Visual Effects Supervisor for the feature films *The Matrix,*
The Matrix Reloaded, and *The Matrix Revolutions*

VISUAL ARTS
Phil Tippett
Founder of Tippett Studios, Visual
Effects Supervisor & Producer

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Experimental Gameplay Workshop

The Experimental Gameplay Workshop provides a platform for designers to showcase risky new work. In-depth presentations illustrate how each game design is different from what has come before, and explain what the designer hopes to achieve through this experimentation.

Presentations are formal 20-minute sessions. An experimenter demonstrates a game and gives a short lecture about the game's experimental aspects. Each presentation focuses on the new gameplay, tradeoffs made to achieve it, difficulties overcome, and problems remaining in the design. A short discussion session and Q&A follow each presentation.

JONATHAN BLOW
Organizer, Experimental Gameplay Workshop

Q. **What was the genesis of the Experimental Gameplay Workshop (EGW)?**

The EGW was created to support the idea that there's a group of developers who strive for originality, and who intentionally try to create new kinds of gameplay.

What exactly this means is a difficult thing to talk about — gameplay is a vague and elusive thing. It's easier to show gameplay than to talk about it. That's what the EGW does, once a year, at the GDC: shows new gameplay.

We know we're doing something right. Both previous years we've held the EGW, the game development community has responded very enthusiastically not only to the games that are being shown, but to the very idea that new things are being attempted.

Through the 1990s, as game budgets grew, publishers became more risk-averse. Correspondingly, publishers placed more pressure on developers to create games that were very similar to prior successes. Too much originality became deemed as risky. Now, the publishers aren't anti-originality — they know

that too *little* originality is also a formula for failure. So they seek to inject some originality into things like character, story, and setting, which are relatively unrisky areas. Messing with core gameplay is extremely risky, so they don't want to do that. They *do* want to improve the gameplay of existing games — they're not trying to make bad games, after all. But they want to do that by making small, incremental changes to established successes.

By the year 2000 or so, this effect had become quite obtrusive to developers and many of us in the industry wanted to see more originality in gameplay. It's the publishers' job to be risk-averse, and that's something of a law of nature, as money is a large and powerful force. So the idea of the Experimental Gameplay Workshop is: rather than trying to change the mainstream industry, perhaps we can accept it, yet augment it to create a richer overall system. Publisher conservativeness is a well-known phenomenon in many art forms — movies and music are two prominent examples. Both art forms have indie movements. Usually these indie works appeal to a niche audience, much smaller (and less lucrative) than mainstream audiences. Nevertheless, the mainstream admires the work of the indies. Whenever an indie does something particularly successful or powerful, it influences the mainstream — some elements of style will even be co-opted directly. This flow of ideas from
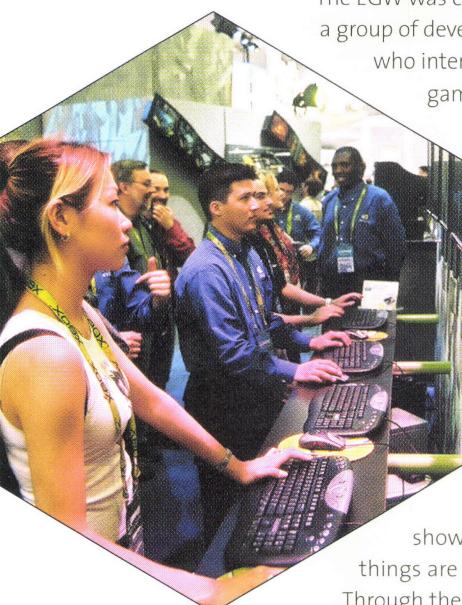
the indie into the mainstream helps keep the mainstream fresh. It prevents the mainstream from iterating too much on proven successes and ultimately stagnating.

The mainstream does come up with its own original ideas, but the indies are just going to try a lot more unusual things. The indies will be hit-and-miss — they will mostly miss — but due to the large number of attempts, the number of good discoveries made by the indies will be significant.

These two pieces — the mainstream and the indie — form a cohesive system that propels the art form. Interestingly, computer scientists can see that this system is effective, because it parallels a common family of algorithms used for solving hard problems. The idea is if you're trying to maximize something, you devote most of your resources (budget) toward searching in areas you already know to be good, so that you can climb higher in that direction. But you want to inject some elements of randomness into the search, to help you find paths you would not have seen. Still, you want to devote only small budgets to these random directions (like indie budgets); since most of them will not lead you in the best direction. So we have these low-probability branching choices that correspond to the indie projects, and high-probability choices that correspond to the actions of the mainstream.

To ensure that the art of computer games is being propelled via this sort of effective search, we need both pieces of the algorithm: the indie and the mainstream. The mainstream has happened naturally, via the profit motive. The indie side, however, has not sufficiently developed yet. What has developed naturally so far is that independent developers are mostly people trying to make traditional games, but with a low budget. Mostly they are amateurs trying to break into the mainstream industry, or industry veterans who are sick of big-company politics and want to kick-start their own businesses. This kind of indie is good for providing career paths and feeding the industry, but it doesn't do much to foster the innovation we need.

> "TO ENSURE THAT THE ART OF COMPUTER GAMES IS BEING PROPELLED FORWARD, WE NEED BOTH PIECES OF THE ALGORITHM: THE INDIE AND THE MAINSTREAM."

Q. **What kind of new gameplay experiences were shown at last year's EGW?**

First, we showed games from the Indie Game Jam, a yearly development-party event. The theme was games you control with your shadow (which is projected onto the display). Gameplay tended to focus on interactions with objects on the screen, in a way that was more intimate than we usually get. We showed 18 of these shadow games in all.

We showed Masaya Matsuura's game MOJIBRIBBON, a rhythm-matching game where you rap in calligraphy using an analog joystick. We saw some examples of the very interesting games created by fans who built WARCRAFT 3 mods. We saw a game where you try to influence the output of a cellular automaton, not by influencing the world state, but by changing the laws by which the world is governed. We saw the details of a game where players used wireless mobile devices to find clues to the disarm code for a hidden bomb — part of the game world existed in the real space of the building, and part existed in a virtual space. We saw a game about rock climbing where you control the game character in a very direct way; at the same time we showed the published PlayStation 2 game ROBOT ALCHEMIC DRIVE, and drew some analogies between the two cases. And we saw a game where you cast spells by drawing mouse gestures, with the game measuring nuances of the gesture shape to control aspects of the spell.

Q. **You've talked a lot about risk aversion in the game industry. So who is going to make the innovative games?**

Publishers will always make some innovative games. It's just that the pace has slowed tremendously. In the mainstream, we have this phenomenon where once in a while we get a developer with star power, who can ramrod a game concept through despite objections. Some examples of this are Will Wright with THE SIMS, or Peter Molyneux with BLACK & WHITE. We also have Nintendo who has adopted a sort of corporate manifesto of creativity in their first-party games, with Shigeru Miyamoto as their public face.

Due to their widespread influence, these games provide a lot of advancement for the craft of game creation. Even when they exhibit flawed gameplay, they present some individual elements for future designers to adapt and re-apply. That's valuable for the entire industry.

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gdc mobile

GameDevelopers
Conference Mobile

Explosive growth of mobile users, short production cycles, and the variety of distribution channels mean the mobile game sector offers major opportunity for both profit and innovation to all game developers. This market needs the creative input from game developers to maintain its momentum. However, as devices become more sophisticated, costs and risks increase.

Only at GDC Mobile do leaders from the mobile communications industry meet with the world's best game developers. Network operators, content aggregators, technology & infrastructure providers and leading game developers together determine the future of mobile game development and develop effective content strategies to engage billions of consumers worldwide.

MOBILE KEYNOTE
Paul Palmieri
Verizon, Director of Business Development

The World of Mobile Games

Featured Presentations: Korea

Creating a Prosperous Mobile Games Ecosystem
Korea has consistently set the pace for innovation in networked games. And Korea's mobile networks are among the most advanced in the world. So it's no surprise that Korean mobile games are world class, too. Attend this session to learn how market leader SK Telecom pioneered and advanced three mobile Internet services that were the first to offer multimedia, multiplayer games and media-rich messaging between players. SKT has fostered a vibrant mobile content ecosystem that generates data ARPU that exceeds $20 a month. Don't miss this exclusive look at one of the most innovative mobile networks in the world.

Lessons in Mobile Gaming from Korea
This session provides a publisher's perspective of the intensely competitive market dynamics that forge innovation. This session consists of an overview of the Korean game scene, including demographics and local taste in gameplay, plus demonstrations of the best that Korean game developers have to offer. And find out what it takes to carve a deal with mobile operators in the region.

The Business of Mobile Games

World Tour of Mobile Games
Mobile games are a global phenomenon, and it's virtually impossible to see them all. GDC Mobile brings the best of the world's games to one place. Don't miss this exclusive session that provides a whirlwind tour of games developed for mobile subscribers from every region of the world. Demos of the most successful mobile games on the planet are provided, as well as some of the most innovative new game concepts. This session places special emphasis on identifying the universal principals of mobile game design.

The Business of Mobile Games
Mobile gaming: Is it a real business, or just a fad? What are the business issues for the industry? How do mobile games make money? What will mobile games ultimately mean to big publishers as they develop future business strategies? The CEO of a leading mobile game publisher explores the potential of this new and exciting industry and shares perspectives on what it takes to enter, and succeed in, the wireless games market.

Big Game Hunting: Console Game Publishers Join the Mobile Fray
American game publishers have discovered what their Japanese and European rivals realized years ago: mobile games are the fastest-growing segment of the game software industry. With *The Economist* projecting that 1/3 of all game software sold in 2006 will be on mobile phones, the traditional console game publishers can no longer afford to sit on the sidelines. This panel session includes representatives from some of the first companies to enter this field, as well as some console game companies who are new to mobile. What conditions must be satisfied before a console game publisher will enter the mobile market? Does mobile present a new opportunity or just a repeat of the online experiment? How appealing is the prospect of dealing with mobile operators? OTA or MMC? Brand extension or new titles? How tightly does the mobile audience mesh with the core game audience?

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The Evolving Mobile Platform

Smackdown: Making Sense of Competing Mobile Platforms

The mobile terminal is in the process of an incredible transformation in response to global demand for new services and new features. To meet this demand, leading technology companies have introduced application development environments and reference designs for advanced mobile terminals, which allow for extensibility via downloaded software. The mobile phone has evolved into a media terminal, with color screen, powerful microprocessor, more memory and more capability. But the content applications that take advantage of these hardware features are largely dependent upon capabilities designed by just four companies. What's next for developers caught in the crossfire of strategic agendas of software behemoths? This panel discussion brings together representatives from the companies who exert the most leverage on the shape of mobile gaming. Attendees learn about new developments and device capabilities, what's next for multimedia and multiplayer games, the battle for the standards and control, and the role of collaboration among industry leaders to create a common, open platform.

The Evolution of Graphics on Cell Phones: the Implications of JSR 184, OpenGL ES and Mobile 3D

3D on mobile terminals is not new, but developers who have grappled with proprietary approaches can now look forward to "write once, run everywhere." Mobile and embedded platforms offer exciting new opportunities for game developers. However, they also have significant limitations compared to traditional desktop graphics environments, including limited memory, limited or non-existent mass storage, limited communications bandwidth and lack of floating point hardware. Existing graphics APIs ignore these limitations and thus are difficult to use in embedded games. This course presents two new 3D APIs that address the special needs and constraints of mobile/embedded platforms: OpenGL ES and Mobile 3D.

Game Design for the Mobile Medium

Game Design Case Studies: Made-for-the-Medium Original Titles

Quality cutting-edge titles, designed with consideration for the medium and produced with skill and expertise, sit side-by-side on WAP menus with lackluster, poorly produced games. And they all sell for £3. Mobile gaming is in the process of shedding an image of retro arcade games and maturing into a medium with unique attributes. A new generation of game developers has maximized these unique aspects of mobility to create original titles of surprising wit and quality. Our panel of expert developers presents case studies of the design process, including how they work around technical limitations and budget issues in order to squeeze every last drop of performance out of a constrained platform.

Mobile Operator Roundup

Each day concludes with a lively interactive dialog with representatives from the leading mobile network operators. This moderated discussion contrasts consumer demand and the evolution of mobile games in each region. Hear their strategies for marketing and promotion of games and new service features. Details about business terms, including deal structure, cross-promotion, deck placement and branding are shared. Attend this session to learn the specifics of network deployments, new handset configurations, pricing plans and marketing milestones of the leading mobile operators. The all-important international operators are represented, as well as major US carriers. In this session, developers have an opportunity to raise questions and get real answers.

MARK CERNY
Cerny Games

Q. **With growing risk aversion at publishers, who is going to make the innovative games?**

A different way of asking this question is "who pays for the prototype?" Even the most risk-averse publisher will jump at the chance to fund development of an innovative game if the prototype is fun and appealing, but developers are being asked to spend more and more of their (unpaid) time creating that prototype! As a result, cost of innovation is placed squarely on developer shoulders. This trend needs to reverse soon, because the independent developers are less and less able to fund these increasingly complex prototypes.

> "THE COST OF INNOVATION IS PLACED SQUARELY ON DEVELOPER SHOULDERS, AND THIS TREND NEEDS TO REVERSE SOON"

Q. **Is EyeToy the beginning of a trend, or an anomaly?**

I think the effects of EyeToy will be felt for at least a decade. It shows us all that the power of innovation is not restricted to the traditional contents of the game. Can it be done again? I'm sure many will try, and I'd love to see what they come up with!

Q. **Can you think of any specific sessions at the GDC that really grabbed you, made you rethink something about technology or the industry?**

Jason Rubin's "Great Graphics: Who Cares?" really made me reconsider what we are doing and how we are doing it. It is very true that even though the technology improves each year, the impact that comes from that technology decreases. We will never again see anything like the change from 2D to 3D in games. Personally, I have changed the way I approach games now; though the graphics technology is very important, I would no longer try to "lead" with it as I have in the past.

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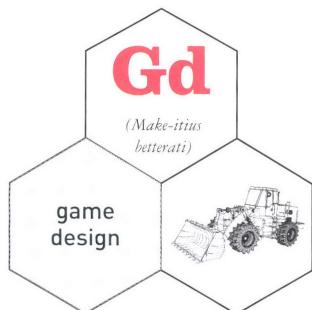
game design

Creating compelling, immersive games requires understanding, visualizing, demonstrating and tuning the interactions of an ever-increasing number of game tools and systems. While game designers need to understand and exploit the possibilities of new technologies such as realistic physics, facial expressions and lighting techniques, they must also continue to master the traditional disciplines of drama, gameplay and psychology. Choosing a focus, balancing the elements and forging a complete experience is the designer's role. The Game Design Track explores the challenges and ramifications of the interaction between new technologies and established techniques.

GAME DESIGN KEYNOTE

Neil Young
Vice President and Executive in Charge of Production, Electronic Arts
▶ Entertainment Experience First, Videogame Second: The Making of THE RETURN OF THE KING

NEIL YOUNG

Q. **How do you see games and the game industry evolving?**

My sense is that we're at an amazingly exciting time in the development of our medium and the industry that surrounds it. It's akin to being around as film began to reach mass appeal and the potential for that medium was beginning to be understood. I feel like we're on the brink of being able to reenergize entertainment with games and it's very exciting.

Q. **So will games be adopting the production model of films?**

Today, the lion's share of development is by a few large studios. Until a business and financing model evolves and, equally as important, a framework for

managing these types of productions comes into play, it's unlikely to change. I imagine a catalyst of change that includes financing, distribution, and talent aspirations could get us to a place where this was possible, but even then our industry lacks the role standardization that would make this type of venture (freelancers coming together for a project) very difficult to put together in practice.

Q. **Are game designers the industry's new stars? What challenges do they face in this new role?**

By now, everyone in our business recognizes the value of the game designer, something that wasn't necessarily true even three years ago. I think that we'll continue to see the

role grow and more true gamemakers emerge: those that can define, articulate, and execute on a vision for entertainment experiences in our medium. Over the next five years I imagine that we'll first see some extraordinary people functioning in the same way that the writer/producer/director functions in the film business. As the roles mature, I'd hope that we would see more delineation and rewarding of specialization. If we're to compete effectively for the minds and minutes of entertainment consumers, we need to compete with mediums that have already recognized that having great people focused and specialized builds better experiences.

The biggest challenge that faces the game designer today is how to delineate gameplay from entertainment. It's

my opinion that, while connected, they are not one and the same thing. We are further challenged by how we learn to package that entertainment into slices that are respectful and cognizant of the demands on our aging average user.

Q. **Where do you see innovation in games coming from?**

Contrary to common wisdom, I think that innovation is more likely to come from large companies who recognize that they need to develop new intellectual properties and making investments in that regard either internally or externally. It feels like we've reached the limit of "me too" products and the industry is beginning to sag under their weight. If we don't continue to innovate, we run the risk of losing the enthusiasm of our customers who, when energized, may

purchase three or four games a year on average but, when disillusioned, may only purchase the one or two games that they know will appeal to them.

Q. **What kind of gameplay experiences do you think will emerge in the future?**

A computer game still hasn't made you cry. I think we'll crack that problem in the next five years and it'll be a watershed event for our business.

Q. **How do you see games influencing world popular culture?**

I think that we have the opportunity to begin defining young adult and youth culture instead of simply trading upon it. It'll take games with aspirational values that speak to our audience, make them think differently about themselves and then

grow from interacting with them. If we can begin the process of building these games we will be as impactful on world popular culture as films and music.

Q. **Is there a widening divide between games produced internally by the publisher and games produced externally?**

The relationship between publishers and third party developers is pretty much the same as it's ever been and I don't see that changing until we see different financing and distribution mechanisms in place for developers. It's unlikely that development budgets for external product development can outpace market growth, and competitive pressure and opportunities are driving spending needs higher. I think that this is pushing more development internally.

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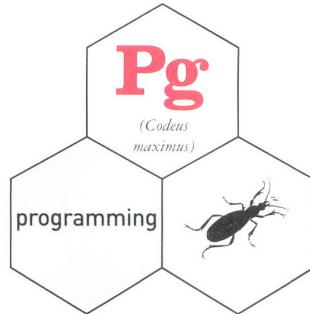
programming

As platforms mature, it takes more effort than ever to produce a game that will capture the attention of the public and press. The challenges facing a programmer in 2004 are no longer how to build systems, but how to build systems that create dense, cinematic, and reactive environments that push the envelope both technically and artistically. The Programming track focuses on the challenges facing game developers working in today's market—mature consoles, a highly competitive sales environment and increased demand for very high production values in games— and prepares programmers for the technology of the next generation.

PROGRAMMING KEYNOTE

John Carmack
Founder, Owner and Lead Programmer, id Software

- **Adding Spherical Harmonic Lighting to the Sushi Engine**
  Christopher Oat, ATI Research
- **Advanced Real-Time Reflectance**
  Daniel Baker & Peter-Pike Sloan, Microsoft, Naty Hoffman, Naughty Dog
- **AI and Design: How AI Enables Designers**
  Brian Reynolds, Big Huge Games
- **Artificial Potential Fields for the Control of Navigation and Animation**
  Bryan Stout
- **Beyond Finite State Machines: Managing Complex, Intermixing Behavior Hierarchies**
  Andrew Stern, InteractiveStory.net, Michael Mateas, Georgia Institute of Technology
- **Building a Million-Particle System**
  Lutz Latta, Massive Development
- **Building an Integrated Asset Management System in 17 Easy Stages**
  Allan Murphy, Jason Williams, & Mike Kenny, Blue52
- **The Collection and Applications of Metrics in an MMP Game: Lessons Learned from THE SIMS ONLINE**
  Larry Mellon, Maxis
- **Common C++ Performance Mistakes in Games**
  Pete Isensee, Microsoft
- **Deferred Shading on DX9 Class Hardware and the Xbox**
  Matt Pritchard, Ensemble Studios & Rich Geldreich, Blank Cartridge
- **Destruction on a Diet**
  Bruce Woodard & John Crocker, Incognito Studios
- **Developing Wireless Location-Based Games**
  Jay Aguilar, DASC
- **Embodied Autonomous Agents**
  Bryan Stout

- **Fast Yet Realistic Deformation and Fracture**
  James O'Brien, University of California, Berkeley
- **THE FULL SPECTRUM WARRIOR Camera System**
  John Giors, Pandemic Studios
- **Game Mobility Requires Code Portability**
  Guido Henkel, G3 Studios
- **High Dynamic Range Lighting**
  Paul Debevec, USC Institute for Creative Technologies
- **Integrating Physics into a Modern Game Engine**
  Brandon Moro, Nihilistic Software
- **Light Scattering: Can We Have it in the Game, Real Quick?**
  Thomas Engel, Factor 5
- **Lua in the Gaming Industry**
  David Eichorn & Jonathan Burns, Microsoft Game Studios
- **The Making of the Official COUNTER-STRIKE Bot**
  Michael Booth, Turtle Rock Studios
- **Massively-Multiplayer Engineering**
  Jeff Johnson, Turbine Entertainment Software
- **Motion Capture-Driven Simulation for Characters**
  Victor Zordan, University of California, Riverside
- **Motion Synthesis**
  Okan Arikan
- **The Physics-Sound System of DEUS EX: INVISIBLE WAR and THIEF 3**
  Brian Sharp, Ion Storm
- **Practical Implementation of High Dynamic Range Rendering**
  Masaki Kawase, Bunkasha Games
- **Practical Physics for Articulated Characters**
  Vangelis Kokkevis, Sony Computer Entertainment America

- **Practical Shadows: Out of the Demo and Into the Engine**
  Tom Forsyth
- **Procedural Shaders: A Feature Animation Perspective**
  Hector Yee, PDI/DreamWorks
- **Programming for PSP**
  David Coombes, Sony Computer Entertainment America
- **Real World Multi-Threading in PC Games**
  Aaron Coday, Intel, Alex Klimovitski, Intel, William Damon, Intel
- **Realistic and Fast Cloud Rendering in Computer Games**
  Niniane Wang
- **Real-time Global Illumination**
  Eskil Steenberg, Quel Solaar
- **Real-time Translucent Animated Objects**
  Greg James, Nvidia
- **Rendering Realistic Hair for Games**
  Simon Green, Nvidia
- **Reusing Shading for Interactive Global Illumination**
  Bruce Walter & Kavita Bala, Cornell University
- **Revisiting the Standard Joint Hierarchy: Improving Realistic Modeling of Articulated Characters**
  Victor Ng-Thow-Hing, Honda Research Institute
- **TRUE CRIME: STREETS OF L.A. Bringing Crime to the City of Angels**
  Jeff Lander, Darwin 3D
- **Using Verlet Integration and Constraints in a Six Degree of Freedom Rigid Body Physics Simulation**
  Rick Baltman & Ron Radeztsky Jr, Rainbow Studios

JULIEN MERCERON
Worldwide Technical Director, Ubi Soft Entertainment
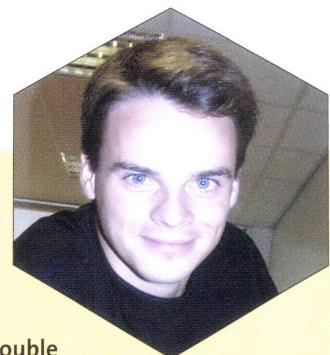
Q. Are game programmers going to be technology drivers or toolmakers?

Making tools is more time-consuming than building engines. The ratio for us is around 75%–25%. Encoding and assisting take more time to define and build than decoding. Reducing the degree of involvement of game programmers on tools is the right way to go, but it means that someone needs to provide the teams with toolsets that are better designed and closer to our needs. This is unlikely to become true in a near future. Even when they do choose an external middleware to do the job somewhere, game programmers are still acting as technology drivers. In conclusion, I would like to express my belief that the role and position of game programmers won't radically change in either of those directions, as the context and degree of complexity to build a game will remain the same for a while.

Q. How will you use middleware?

This is a very good question. Come and see my "Impact of Middleware Technologies on your Game Development" talk at GDC 2004.

Q. Where will innovation in games come from?

My game director colleagues spend their time fighting for more immersion and more involvement. From my standpoint, I'll have to provide new techniques that will actually make these games more immersive and involving. All this is already on its way, taking in account the evolution of hardware architecture and performance. As an example, one of the paths chosen to take care of world coherency (a subset of immersion) is to work on redefining materials, so they have their graphics, sound and physics counterparts. Generally, I would say that graphics, physics (rigid and soft body dynamics) and animation to be at the heart of innovation for immersion; and gaming modes and AI for involvement.

"GRAPHICS, PHYSICS AND ANIMATION ARE GOING TO BE AT THE HEART OF INNOVATION FOR IMMERSION; AND GAMING MODES AND AI FOR INVOLVEMENT"

Q. What are the trouble spots for console tools for next generation development?

With internally developed tools, you need to make sure you have the right people working on them, and that these people have access to everything they need. But it is rare to see developers rely only on internally developed tools, because of the energy needed to cover all the aspects of game creation, and the quality of the existing offerings: hardware manufacturers with exporters and data packing tools; digital content creation-oriented companies with complex suites of modeling, texturing, lighting and animating tools; and third party middleware. A new trouble spot is born: getting the complete vision of the tools that will be present so that you can understand the different solutions you have, and choosing the best partners so you can focus your tools development. If you're lucky, you'll only develop the ones that are game specific and the ones that will make a huge quality or production speed difference compared to the competition.

Q. Who were you surprised or excited to meet at the GDC?

Designing technology, tools and pipelines involves making choices taking in account as much technical parameters as possible such as the hardware architecture, the library/drivers interface, the algorithms complexity, the data footprint, the language and compiler specificities, etc. Once all those parameters have been studied and projected onto your game, you get your technical vision of the game. The first time I met Stephen White of Naughty Dog, I realized our vision was probably taking into account less than one fourth of the parameters he fluently manipulates. That day, I felt like I woke up from a long sleep. Since then, I have never stopped working to integrate into our vision the most significant parameters we were missing... it is not completely done yet.

Pd
(Workili dificilis)

production

Fig 46
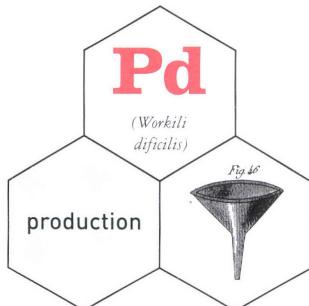
Game production values are at an all time high and the demands upon game producers continue to grow. Producers must manage expanding development teams, skyrocketing budgets, larger games and a growing global market to create games that stand out from the crowd and find an audience. Production track sessions continue to offer proven tools and techniques to take a project from pre-production to shipping, on time and under budget. However, as dramatically more sales occur within the top 10 games, the Production track will help tighten a producer's focus by looking more clearly at the market and the resources needed to put out these games.

PRODUCTION KEYNOTE

David Perry
Founder and President, Shiny Entertainment
▶ Production Through Collaboration: Escalating Demands on the Producer

▶ **Accurate Prediction and Other Organizational Myths**
Star Long, NCsoft

▶ **Artist Management in a Small Games Company**
Di Davies, & Steve Derrick, Vicarious Visions

▶ **Automation Recipes: Automation Ideas to Save Project Time and Money**
Jennifer Boespflug, Microsoft Game Studios

▶ **Building Big Licensed Games with Big Teams**
Don Daglow, Stormfront Studios

▶ **CG Cinematic Production: From Conception to Completion**
Lorne Lanning, Oddworld Inhabitants

▶ **Creating a Monster RPG: The Light and the Dark Side of Development on STAR WARS: KNIGHTS OF THE OLD REPUBLIC**
Casey Hudson, BioWare

▶ **40 SKUs in One Day, Producing Multiple SKU Simultaneous Delivery**
Gavin Cheshire, Codemasters

▶ **Growing a Dedicated Tools Programming Team: From BALDUR'S GATE to STAR WARS KNIGHTS OF THE OLD REPUBLIC**
Don Moar, BioWare

▶ **How to Budget Audio: "What Am I Forgetting?"**
Tommy Tallarico

▶ **Managing the Hydra: Successfully Running Multiple Projects in a Videogame Studio**
Ray Muzyka & Greg Zeschuk, Bioware

▶ **Master Your Game's Domain: Data-Driven Asset Management**
Rick Holtrop, NCsoft

▶ **Producing Motion Capture and Animation**
Jarrod Phillips & Tom Tolles, House of Moves

▶ **Producing Programmers: Strategies for Managing Technical Staff**
James Vlad Ceraldi & Tim Bennison, Radical Entertainment

▶ **REPUBLIC: Lessons Learned**
Demis Hassabis, Elixir Studios

▶ **Requirements for a Next Generation Massively Multiplayer Online Game**
Gordon Walton, Sony Online Entertainment

▶ **SOCOM II: Creating a Compelling Online Console Game**
Seth Luisi, Sony Computer Entertainment America

▶ **Seven Years of MAX PAYNE**
Markus Maki, Remedy Entertainment

▶ **The Easy Route To Console Online**
Shawn Hargreaves, Climax Studios

▶ **The Impact of Middleware Technologies on Your Game Development**
Julien Merceron, Ubi Soft Entertainment

▶ **The Interface: How to Create an Effective Audio Schedule**
Alex Brandon

▶ **Producing Orchestral Scores for Games**
Jack Wall & Tommy Tallarico

▶ **User Created Content: Is it Worth It?**
Trent Oster, BioWare

▶ **User-testing in a Hostile Environment: Overcoming Apathy and Resistance in Game Companies**
Bill Fulton & Ramon Romero, Microsoft

▶ **Using External Contractors Effectively**
Marc Aubanel, Electronic Arts

▶ **WALLACE AND GROMIT IN PROJECT ZOO: A Postmortem of a Licensed, Cross-Platform Game**
David Braben, Frontier Developments

▶ **Winning the Race Against Pirates And Crackers: Next Generation Copy Protection**
Erik Simon, JoWooD Productions

CHRIS TAYLOR
Lead Designer, Gas Powered Games

Q. **The role of the producer has become a driving force in the creation of a game. How do you see this role continuing to evolve?**

It's getting closer to what the film definition is, and it's been a huge improvement for our business. One central leader who can guide the whole development process is going to help us all make better games. I see it improving in so much as everyone will eventually be on the same page as to how critical the role is.

Q. **Are the old development methodologies going away?**

I don't think the old methodologies are going away. We are just getting more sophisticated in the processes that we use. We take a lot of the project management ideas from Hollywood, it's true, but we aren't losing our identity while doing so.

DAVID PERRY

Q. How do you see games and the game industry evolving?

The quality of games is constantly improving, and many people that have never really considered playing a game are finding them more and more alluring and interesting, and they're drawn to them like moths to light. Maybe they can hold out for one more hardware generation, but it won't be much longer until we find a way to hook them. I commonly say to people, "I don't care where you are, at home, at work, on airplanes, in hotels, on your PDA or cell phone, at some point we will get you playing games!"

Q. How is the role of the game producer changing?

There's been an evolution over 30 years. In the beginning, one guy would do all the programming, all the black-and-white artwork and the beeps! Now we have programmers and designers for every aspect of the game, pushing development team sizes to 60, 70 people for just one game. Not only is the producer trying to wrangle bigger teams, but they're also handling ever more complex game designs and bigger budgets. The risks are enormous. Mathematically, projecting forward, at some point, it's going to be the most stressful job in the world!

Q. Will independent production companies that finance and produce games, as we see in the movie industry, take decision making power away from publishers?

I don't see this happening. Especially when you consider that a good amount of the decision making is creative, and that's the one thing you don't want to take away, or you end up making creatively weak games.

Q. Given that there are so many ways to make games look better and sound better, do you find that there are too many resources given to this as opposed to making a game more fun to play?

It's definitely a balance and some developers strike that balance better than others. If you look at the resource allocations at a top-tier developer today, I am sure you would see that gameplay is still king.

Q. What is the biggest challenge facing producers?

As a career, it's becoming key that they are working on the right gig for themselves. Projects are becoming monsters, eating up two to four years of their working lives at a time. For that reason, they need to make sure that they are working on something relevant, something that matters to them, or they might suddenly realize that eight years have passed them by. This issue is made worse by the way the sales of games function. If you start a project that has little chance of ever being Top 10, then you need to worry about that team even being allowed to finish. Publishers used to err on the side of letting projects live; in the future, I expect all the surviving publishers will be quick to kill projects at their first sign of weakness.

Q. Where do you see innovation in games coming from?

As always, innovation comes from designers that are given the chance to show their hot new ideas really work. If you were a publisher, would you have given Will Wright the money to make THE SIMS? At some point, you NEED to trust the designer. I think the winners will be the wealthy publishers that can afford to seed this R&D game design. They will continue to reap the rewards.

Q. What kind of gameplay experiences do you think will emerge in the future?

I'm expecting to see more games where you are not the hero of the world, but a hero in the world. Meaning, a small person trying to make a big difference. Long term, I am hoping (someday, when America has broadband like South Korea) to see quality gameplay video served directly to gamers' homes by game makers. Imagine a console at home that is simply a video server and input device that lets you jack into a kick-ass gaming rig (like a super high-tech flight simulator) somewhere else in the country.

Q. When will games be on equal footing with other entertainment forms?

I think games have a long way to go before they have anything like the effect of music and movies. When an A+++ game can have a marketing budget greater than an A++ movie, then we will be in position to really shake everything up.

Q. How is the relationship between developers and publishers changing?

I think publishers will continue to go in two directions. First, starting more on-campus training — finding raw talent and training exactly for your needs. Second, buying up every developer that gets a hit. It's so much easier to hand $10 million to a developer that has made a fantastic game than to hope you have the next diamond in the rough.

Q. There is a lot of talk about game production evolving into a Hollywood model. Is that where the industry is going as a whole, or will it be a mixture of the traditional and new?

Hollywood has always been a great place to acquire licenses, but in the past, it's been impossible to really collaborate because of the aspirations of the real Hollywood talent and the relative weakness of the gaming hardware. Both of these issues have changed, and so

Va

(Burnus eyeballius)

visual arts
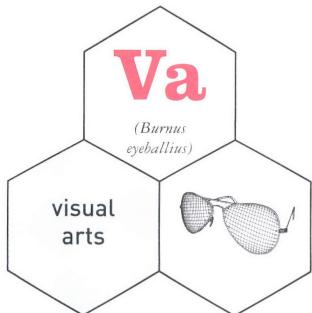
Free from many technological constraints, the focus of game art is shifting from simply attaining the best possible production quality to exploring new ideas and art styles that allow a game to stand out from the competition. In parallel, Visual Arts in the game industry has grown incredibly complex. This year, the Visual Arts track provides longer format classes to allow speakers the time to walk attendees step by step through the latest tools and techniques. Each class will be self-contained to provide the specific practical knowledge of advanced techniques to take game art in new directions.

VISUAL ARTS KEYNOTE

John Gaeta
Visual Effects Supervisor for the feature films *The Matrix*, *The Matrix Reloaded* and *The Matrix Revolutions*

VISUAL ARTS KEYNOTE

Phil Tippett
Founder of Tippett Studios, Visual Effects Supervisor & Producer

BOB RAFEI
Art Director, Naughty Dog

JONATHAN PEEDIN
Art Director, Red Storm Entertainment

Q. **How is the role of the game artist changing? Are they becoming more specialized producers of stock assets?**

BR. Given the amount of data that needs to be created for competitive games today, artists are forced to specialize, with mixed results. The advantage for younger artists trying to break into the industry is simply more demand, and the ease of focusing their skill sets on desired positions of an art pipeline. In other words, they don't have to include the complete range of skills in their reels previously required for joining an art team. The downside, however, is the potential for typecasting, and little opportunity for lateral movement into other tasks. For veteran artists, there is the frustration of not being able to do it all, or having creative control, as was required before.

JP. As the technology continues to improve and demand a

greater degree of skill and finesse in order to properly utilize all the tools and techniques available, I believe that the requirements for the artist to improve his visual design skills and technical understanding will only continue to increase. Over time there appears to be a greater need for specialists that are really good at specific tasks, e.g. lighting, texturing, etc. Often these people are made the final "gate," so to speak, with regards to these skills, meaning that other people may do some of this work, but the final touches and edits will usually be handled by one or two key individuals in order to harmonize all the components into one polished vision.

Q. **To what extent is creativity being lost as a result of licenses and asset consolidation?**

BR. Our creative limitation is usually a reflection of our imagination. Sure, there are certain expectations that come

with license titles, but for the most part, the titles that are memorable become so due to their ability to stand on their own. In achieving this, they will enforce and help elevate their license, which by definition is a member of a bigger family.

JP. More to the point, I think that creativity starts to get lost as cost for the projects go up. When a company is going to be spending millions to make and market a game, with a staff of 40+ people, then one of the biggest risks is to not know exactly what it is that you are making and how it will come together. This is probably going to mean that some people will routinely end up with the labor work of making objects, building vehicles and other similar tasks.

Q. Where do you see this creativity springing from in the future?

BR. Game development today has a lot to do with risk management from expanding budgets. Understandably, a lot of games are safe in their approach to an established genre. Originality and creativity will come from the bottom—hungry young teams that don't care about obstacles since

they probably haven't experienced them—and the top selling teams, with the comfort of a few successful games in their vault. They are encouraged to take some risks. These teams can also weather some poor decisions. They probably got where they are due to their risk taking, "out of the box" approach.

JP. Once we reach realism in real-time rendering then the creativity is going to have to come from elsewhere or in using the power of the hardware differently. Being more inventive to establish a different look that helps to set the visual style and flavor of a game apart from its competitors will become more important.

Q. Are artists overly reliant on tools and FX at the expense of creativity?

BR. Not really. It's these tools and FX that allow artists to expand the envelope. The better tools and FX are the results of artist and programmer collaboration.

JP. The key goal is to be creative within the restraints of a particular tool in order to make the end product look like you didn't use the tool.

Cyrus Lum
Inevitable Entertainment
Visual Arts Track Program Chair

We are very excited about this year's Visual Arts track. We've worked towards bringing some very well known people in the visual arts field in both games and film to lecture. As the technology allows the two medias to converge, having a combination of the skills in both fields become more necessary. Artist tools developers such as Discreet and Maya are offering exclusive master classes to help artists take greater advantage of the current programs. We've also refocused the classes towards intermediate and advanced artists as well as made the lectures more in-depth by expanding some of the lectures to two hours. The Visual Arts track in 2004 has more practical take-away for artists who have questions about how to better use the tools out there now as well as a peek at other alternatives.

Au
(Boomus giganticus)

audio

Game audio makes movie soundtracks seem simple by comparison. Games routinely involve the scripting and editing of 40,000 lines of dialog, multiple variations of orchestral scores and sound effects with real-time controls. This requires a unique fusion of craft and technology, and is shared by musicians, sound designers, programmers and game designers. From sessions designed to polish the skills of a veteran composer to case studies that shed light on programming techniques and tools that bring those compositions to life, the Audio track offers real world information to take game audio to new heights.

MARTY O'DONNELL
Bungie Software

DAVE RANYARD
Sony Computer Entertainment Europe

CHANCE THOMAS
President, HUGEsound

Q. **How has the technology you are using changed with the advent of more sophisticated home theater systems?**

DR. We have installed a state-of-the-art monitoring system in our main control room so that we can master different surround sound systems. We now implement Pro Logic II in most of our projects. We take surround sound very seriously. It can really add to the feel of a game.

MO. Three and a half years ago, when I realized that we would be developing HALO for the Xbox, the prospect of delivering a game with true 5.1 surround sound in people's living rooms became a reality. Immediately we knew that we had to make sounds and music that could stand up to the scrutiny of consumers who would also be listening to DVDs and CDs through the same systems.

CT. This technology has changed for the audio engineers who are now having to mix and encode in various surrounding formats.

Q. **How are you selling producers on the benefits of live orchestra now that games are making better use of it? When and how do you use it?**

DR. To be honest, most producers love the idea of using live orchestras and live instrumentation. Obviously we need bigger budgets for this, but they will argue for them along with us. I think most producers like the idea of the game music being worthy of a sound track release alongside the game.

MO. I don't like to sell anyone on anything. I just want to be able to use every tool at my disposal. Live orchestra is one tool of many. If it makes aesthetic sense to hear an orchestra playing, then I'll record one. The key for me is to record live musicians when I need them, and not to rely on samples or synths simply for reasons of cost. I used a lot of live orchestra on music for HALO and even more for HALO 2.

CT. Orchestral scoring fits best in an epic game where you want the player to experience larger-than-life emotions. This can be done with digitally sampled elements fairly convincingly today. So going to live orchestra is basically a quality/standards pitch.

> "I THINK MOST PRODUCERS LIKE THE IDEA OF THE GAME MUSIC BEING WORTHY OF A SOUND TRACK RELEASE ALONGSIDE THE GAME."

DOLBY

Sound system provided by Dolby

> "WE KNEW THAT WE HAD TO MAKE SOUNDS AND MUSIC THAT COULD STAND UP TO THE SCRUTINY OF CONSUMERS WHO WOULD ALSO BE LISTENING TO DVDS AND CDS THROUGH THE SAME SYSTEMS."

When I make the pitch, I use several before and after examples showing the difference between good synthesized production and live production. It pretty much sells itself.

Q. Now that audio is becoming more central, how are your relationships with other team members evolving?

DR. There has been a steady growth in the in audio to match its integration into the development process. We have gone from one guy in a back office to a five strong team with proper high-end recording studios in only a couple of years. Becoming a department means that we have more experience and more manpower to add to each project in key stages of development. The relationships with teams seem to flourish in this kind of environment. It's always important to listen and communicate with the members of the team.

We're now producing a number of titles which are very music based—this collaboration has brought us much closer to the core of the game design. For example, the EyeToy game GROOVE which will be released this Christmas.

MO. I only started working on game audio in 1996, so I haven't been through some of the early days. On every game project I've shipped, I got to be involved from the very beginning. I really won't work any other way.

CT. I find myself having lots more meetings with programmers now, whereas before I only used to bug the designers and artists.

more and more, Hollywood talent is getting interested in the job stability of our industry vs. the very demanding lifestyle that Hollywood requires. And the quality of the gaming hardware is finally at a point where the talent both understands and is interested in the challenge.

Q. Will there ever be independent production companies that finance and produce games, like the film industry, or will publishers remain in that role?

There absolutely will be independent productions, but it's going to take A+++ levels of collaboration, followed by hits, to convince a lot of people. I expect that publishers will strike up distribution deals with these entities. The publishers' distribution strengths will be key if they want to end up shipping titles from these new production companies.

B1

(Legalactionus avoidialus)

business+ legal

All studios face enormous challenges today. The game industry is mitigating risk by basing a large proportion of new products on known licenses and sequels to popular games. Projects perceived as too weak to take to market are more likely to be killed during development. To create a business environment that supports the creation of superior games, developers need both sound business strategies and outstanding tactical execution. The Business and Legal track looks at the game development process from the standpoint of running the business and offers proven strategies for the developer who needs to understand complex business issues.

▸ **A Road Map for Peace: Redefining the Publisher-Developer Relationship**
Joe Minton, Cyberlore, & Jon Walsh, Groove Games

▸ **Building Value in Your Company: One Small Studio's Approach**
Jeremy Gordon, Secret Level

▸ **Doing Business with Europe: A Survivor's Guide**
Vincent Scheurer, Osborne Clarke

▸ **The End Game: How Top Developers Sold Their Studios**
Dan Rogers, BizDev

▸ **Everything You Need to Know to Make Money in Coin-Op**
Elaine Hodgson, Incredible Technologies

▸ **Follow The Money: Understanding Console Publishers**
Bill Swartz, Mastiff Games

▸ **Game Soundtracks: Structuring Your Deal Like the Movies**
Jim Charne, Law Offices James Charne

▸ **Getting Paid for Milestones: How to Avoid Being Stiffed When They're Giving Your Publisher Last Rites**
Jim Charne, Law Offices James Charne

▸ **How to Get More Coverage for Your Company and Titles**
Sue Bohle, The Bohle Company

▸ **How to Make Money in Downloadable, Persistent World, and Mobile Games**
Gordon Walton, Sony Online Entertainment & John Welch, AtomShockwave Corp

▸ **Immigration for Foreign Games Professionals in the Age of Homeland Security**
Ron Rose, Rose Rix & Bennett

▸ **Industry & Government: Working Together**
Alison Kelley

▸ **Interfacing With Hollywood: Challenges and Opportunties**
Keith Boesky, ICM Talent, Leonard Grossi, Endeavor, Charles Hirschorn, G4, Jason Rubin, Naughty Dog, Larry Shapiro, Creative Artists Agency

▸ **The I-Spy Book of Developer Contract Law**
Darren Jobling, Eutechnyx Limited

▸ **Minefields in Videogame Intellectual Property Protection**
Stephen Rubin, Law Office of Stephen Rubin

▸ **Mobile Games: Down to Business**
David Collier, gamelet.com

▸ **Mobile Games: Lessons from Online Games**
Dan Scherlis, Etherplay

▸ **Music Licensing for Videogames: How Popular Music and Artists Can Make Games Pop**
Keith D'Arcy, EMI Music Publishing, Nelson Bae, Sonic Fusion, Seth Berg, Victor Rodriguez, Sony Computer Entertainment America

▸ **The Negotiation**
Tom Buscaglia, T.H. Buscaglia & Associates

▸ **Online Games Business: Best Practices, or Learning from the Smart (and Not So Smart) Things Other People Don't**
Jennifer MacLean, Comcast Online Communications

▸ **Pitching an Original IP: Notes from the Field**
Chris Charla, Digital Eclipse

▸ **The Publisher' "Rules of Acquisition"**
Tom Buscaglia, T.H. Buscaglia & Associates

▸ **Secrets of Successful Indie Developers**
Steve Pavlina, Dexterity Software

▸ **Spare No Expense: Starbucks and Aeron Chairs for Everyone**
Mike McShaffry

▸ **Starting a New Studio**
Demis Hassabis, Elixir Studio, Rob Huebner, Nihilistic Software, Alex Garden, Relic Entertainment, Erik Bethke, Taldren, Lewis Petersen
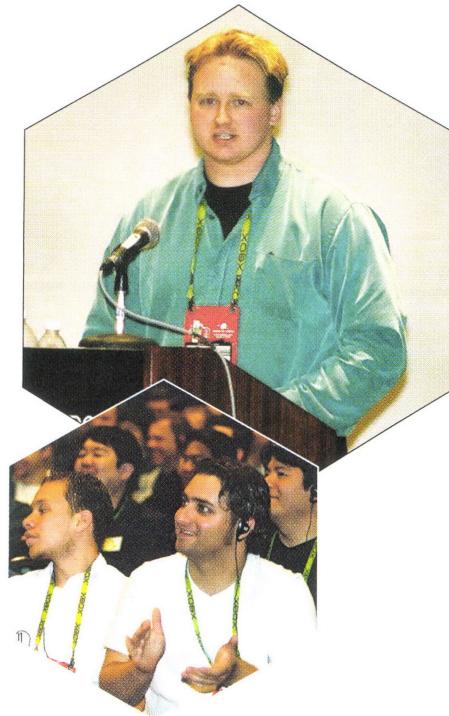
▸ **Understanding the Elements of Employee Compensation**
Peter Friedman, Peter H Friedman, CPA

▸ **The Well-Fed Freelancer: A Survival Guide in 24 Easy Lessons**
Francois Dominic Laramée

▸ **What to Do When it All Goes to Hell: Lessons Learned Shutting Down a Game Studio**
James Gwertzman

▸ **You Have Built a Successful Game Development Business: Now How do You Sell It?**
Paul Heydon, Commerzbank Securities

Masaya Matsuura, Masahiro Sakurai, Kenji Kaido and Fumita Ueda

Q. What are the challenges faced by Japanese developers when developing games for the Western market?

MM. It's difficult to get a sense of culture according to regional differences without actually living there for some time. But I think it's an outdated way of thinking to assume it's something that we cannot overcome. So my challenge is to keep encouraging myself with this assumption.

MS. When I play an American game and the text is unnatural or not translated, the game itself becomes harder to play and not so interesting. So even though it takes some effort to do it, I always want to do good text translation at least. But it's not always successful.

KK + FU: This may be a conventional remark, but how to deal with the language and culture differences, and to absorb the differences of the game style of the users are a challenge. We have to keep this in mind from the beginning of the whole project or else we will end up facing more difficulties later on. Nonetheless, we as a team believe that whatever we create, if the product is good, it will be highly regarded domestically or internationally.

Q. All your games were departures from games seen before. From where did you draw your creativity and inspiration?

MM. For me, playing and listening to music is similar to games.

MS. I have deep respect for the fact that it is possible to control the things inside the TV monitor. Basically, my motivations come from some "pleasure of control." Sometimes inspiration comes from other games, but sometimes from totally different places.

KK + FU: In the early stages of the development, our aim was to defeat the conventional rules of the video game. We believe that this aim is the key to develop reality and to design a game with popular appeal.

Q. How will you influence innovation with your next game concepts? Do you consider the health of the industry as a whole when you determine your approach to innovation?

MM. I don't know about the influence. In the game world, as an industry, people only see and admire games that

were successful whether innovative or not. A healthy business world is where the creative and industrial sides are competing continuously. If we lose this kind of generous competition, the art form will have a bigger problem than just simply being unhealthy.

MS. Sometimes I feel a gap between what creators make from their creative desires and what customers want. My goal is to make games in which the customer can have more self-direction and wider playability. I also think it's ok if a game is easy or doesn't target the hardcore gamer with massively intricate story and overly difficult gameplay. My target audience is people who aren't playing games right now.

> ## "MY TARGET AUDIENCES ARE PEOPLE WHO AREN'T PLAYING GAMES RIGHT NOW"
>
> *– Masahiro Sakurai*

KK + FU: Our foremost aim is to offer something new to the users, and if as a result of doing the best of what we can, something innovative has been created, so much the better. We don't really consider the health of the industry; we just concentrate on our pure desire to develop something good. Needless to say, we are very happy if something we did has a big influence on the industry.

Q. In recent years, game sales have been flat in Japan. Do you think the Japanese market has exhausted its growth potential?

MM. No. But maybe game creation that can be categorized with existing concepts doesn't work so well anymore. That's why we are challenged very hard.

MS. To be honest, the Japanese game market is in a very severe situation. But it can be said that it is a preparation period for titles that are beyond the limits of existing games.

KK + FU: We don't think so. It's more like the game market is growing and changing day by day, and our business is not keeping up with the speed of the growth and change. For example, the population of the mobile phone game players is growing. Therefore, we may be losing some of those precious users. It may not be the game sales and market that is flat. It may be us.

Q. How is the trend of emergent gameplay impacting the game design role?

MM. I think our game Mojibribon is a good example of such a game. Game interaction is usually very simple such as just pushing the button of a controller, but as a

igda

As a reflection of the IGDA's mission to foster the industry, the sessions in this track address the most relevant topics affecting the developer community today: violence and social issues; preserving our past; gender inequities; business practices, etc. The IGDA track offers a means by which developers can get involved - nearly all sessions are directly linked to committee work and outreach efforts. Attendees come away from the IGDA sessions empowered to make a difference in the game industry.

ERIC ZIMMERMAN
game lab

Q. Can unattached IP succeed in the current climate?

Yes and no. On the one hand, the fact that most successful games these days are attached to some kind of license is a sign that games are finally entering into the global ecosystem of mass pop culture. This is a promising development, because it means that games are gaining ground on more established media cousins like music and film.

However, it's not necessarily a rosy picture for games. The question about games being "marginalized" comes down to exactly how games relate to these more dominant media. For example, games tend to carry licenses created by film, television, and literature and not the other way around. Games need to be generating their own intellectual properties, or they may, as Seamus Blackley has warned in his keynote at GDC Europe 2003, become merely a marketing tool for cinema. That would not be a healthy prospect for our young medium, which is still in the process of inventing itself.

Warren Spector's game design keynote at the GDC last year addressed this same issue, but from a different point of view. In part, he chastised game developers who too quickly dismiss the idea of working on licensed properties. Spector focused on the particular design challenges that licensed games present and they do come with their own set of unique and fascinating design problems. Some in the audience were heartened by Spector's defense of licensed games as valid avenues for game development. Others were distressed by the fact that he did not agitate for the creation of more original games. After the GDC, the debates sparked by his talk continued. For example, Warren Spector and Greg Costikyan clashed on the issue online at Greg's blog, www.costik.com/weblog, along with many other developers.

Questions like this one are important, but do not have simple answers. The continuing debate over licensed games is a great example of how the GDC enables developers to engage with important issues that cross design, business, legal and production boundaries.

Q. Can innovative games succeed in a hit-driven business?

The current state of the game industry is the result of a number of interrelated factors, including economic, technological and cultural variables that have affected the way that games are created, distributed and experienced. The retail game industry is consolidating, and becoming more and more of a hit-driven business. Yet it seems clear to most developers that we have just begun to scratch the surface of what games can be.

What is the answer to this dilemma? One possibility is academia. Universities are becoming increasingly interested in games, whether it is to train new generations of game developers, study games from a scholarly point of view or conduct game-related research in a design or technology field. Operating without the constraints of the commercial game market, students and researchers in university environments are in some ways more free to pursue innovation than members of the game industry. The interdisciplinary nature of a university environment and the lack of pressure to produce a hit lend themselves to the creation of games that a commercial company could never consider. At the GDC, sessions like the Academic Summit tutorials over the last few years have tried to foster connections between the university and the game industry to result in just such work.

On the other hand, it's not clear to me that academia has ever been a fountainhead for new forms of pop culture. Let's say that a group of college students get together and

- **Academics' Group Gathering**
Matteo Bittanti, European Institute of Design, Milan

- **AI Interface Standards: Open Beta**
Alexander Nareyek, Intelligent Agents Lab, TU Munich, Nick Porcino, LucasArts Entertainment

- **Chapter Coordinators' Group Gathering**
Liz Wakefield, IGDA

- **Creature Artists Group Gathering**
Jason Wiener, Art Institute of California

- **Demo Sceners' Group Gathering**
Paul Bragiel, Paragon Five

- **Diversity in Game Development: Beyond Stereotypes**
Darrell Porcher, Sony Computer Entertainment

- **ESRB Explained: Behind the Ratings**
Marc Szafran, ESRB

produce an amazingly innovative game. What do they do with it when the code is complete?

What games really need are alternative contexts for funding, producing and distributing games. Film has granting foundations, traveling festivals and independent cinema houses. Music has college radio stations, small record labels and DJ club culture. Games need these forums for more marginal cultural production as well. As in film and music, a handful of ideas and styles from alternative games will make their way into the mainstream retail industry, keeping the medium fresh as a whole. Otherwise, games are in danger of becoming creatively stagnant.

In recent years, the GDC has done much to foster experimentation in gaming. The Independent Games Festival (IGF) showcases indie games, selected by a jury of industry experts. The IGF has fostered a number of success stories, helping bring otherwise overlooked games into the spotlight and onto the shelf. But it is not enough. Our industry needs more venues like the IGF that will eventually make experimental and innovative games a commercially viable avenue for game developers interested in creating alternatives to the mainstream.

- **The Education of a Game Developer**
Eric Zimmerman, gameLab

- **Forward: A Working Session for Women in Game Development**
Sheri Graner Ray, Sony Online Entertainment

- **Game Accessibility Implementation**
Thomas Westin, Pin Interactive AB

- **Game Credits: Towards Industry Guidelines**
Dave Weinstein, Red Storm Entertainment

- **IGDA Chapter Development**
Liz Wakefield, IGDA

- **IGDA Quality of Life White Paper Unveiling**
Dustin Clingman, Zeitgeist Games, Francois Dominic Laramée, Greg LoPiccolo

- **Journalists' Group Gatherings**
David Thomas, Denver Post/University of Colorado

- **Lawyers' Group Gathering**
Jim Charne, Law Offices James Charne

- **Learning by Design: Games as Learning Machines**
James Paul Gee, University of Wisconsin-Madison

- **Long-Term Career Strategies: Advancing to the Next Level**
Ellen Beeman, Monolith Productions

- **Make Better Criticism: A Mature Form of Cultural Analysis**
Matteo Bittanti, European Institute of Design, Milan

- **Massively Excessive: Addiction or Irresponsibility?**
Damon Watson, Bryan Cave LLP

- **Newbie Group Gatherings**
Marc Mencher

- **Practical Game Theory: Academics Fragging Developers**
Gonzalo Frasca, Powerful Robot

- **Preserving Videogame History**
Simon Carless, Slashdot Games

- **Quality of Life: The Next Step**
Francois Dominic Laramée

- **Students' Group Gathering**
Alison Kelly, University of Utah

- **Towards Relevant Research: Collaboration 101**
John Laird, University of Michigan, Mark DeLoura, Sony Computer Entertainment, Raph Koster, Sony Online Entertainment, Robin Hunicke, Northwestern University

- **Thievery or Flattery: Ethics and IP Rights**
Tobi Saulnier, Vicarious Visions

- **Violent Videogames: Threat or Menace?**
Daniel Greenberg, Universal Interactive

- **Women's Group Gathering**
Jessica Lewis, Maxis

- **Writers' Group Gathering**
Chris Bateman, International Hobo

- **You Have Built a Successful Game Development Business: Now How do You Sell It?**
Paul Heydon, Commerzbank Securities

result, it can be said that everything about a game is how much memories were passing through the players' minds. Many games

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"WHEN THERE'S A BIG SHOCK OR CHANGE, WE MIGHT NOT CALL IT A 'GAME' ANYMORE"

—MASAYA MATSUURA

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are based on pleasant sensations occurring from quantifying existing actions and images into button action, but future games won't be all the same. I think this change is slow but certainly improving, but when there's a big shock or change, we might not call it a "game" anymore.

MS. In my games, I attach greater importance to whether or not "players can enjoy it free style". So there's no sense of the compulsory. Many recent games are like operations in some sense. Players can feel like they are being forced to do something. Maybe many people are sick of it.

If the example of emergent game play is MMORPG, it's possible to put compulsory gameplay in it, or people can also enjoy it freely without any limits. Possibilities expand including good and bad ways. Anyway, I think it's the best if players can feel free.

KK + FU: If you are curious to know the impact and impression of the emergent games, we personally feel the changes of the interface such as EyeToy are very interesting.

TWO DAY TUTORIALS • MONDAY & TUESDAY MARCH 22 & 23

▶ (348) • SERIOUS GAMES SUMMIT

Ernest Adams, Mark Bieler, Joe Costello, Noah Falstein, James Paul Gee, Robert Gehorsam, J.C. Herz, Randy Hinrichs, Marc Prensky, David Rejeski, Ben Sawyer, Kurt Squire, Jack Thorpe, Stefaan van Hooydonk, Doug Whatley

The Serious Games Summit is a two-day event covering the intersection of games, learning, policy and management. Today, major corporations, government and military institutions, foundations, educators and non-profits are turning to games and commercial entertainment technologies as an exciting new approach to solving problems.

The result is a new field where computer and video games are applied to "serious" purposes other than entertainment that represents a growing financial outlet for game developers, where projects can produce social return in addition to an economic one.

To help share current knowledge, expand communication among peers and advance emergent best practices, the Summit brings together a number of speakers, presentations and panels that will appeal to customers, developers and evangelizers of serious games.

Intended Audience

The Serious Games Summit agenda is designed to address shared and specific areas of concern to several key groups interested in this topic. This includes professional developers who want to understand how to develop new business in this emerging market, educators and gaming advocates looking at new ways to utilize interactive game technologies, and representatives from corporate, government and non-government organizations who are looking to fund and utilize game projects to advance specific needs, and organizational agendas. Content at the summit addresses all of these issues and more relevant to each key constituency.

Idea Takeaway

Attendees of the Serious Games Summit learn how extensive the application of games and game technology is and can be outside of the traditional use of entertainment. Attendees also gain considerable hands-on insight on how to successfully launch new serious game projects and advance things beyond the experiments and pioneering endeavors that have taken place so far. This includes developers learning how to attack new markets, and potential users obtaining a much deeper level of understanding on how to make their present and future projects much more successful.

▶ (351) • DEVELOPER BUSINESS SUMMIT: AN IGDA THINK-TANK

Jason Della Rocca, Tom Frisina, Trip Hawkins, Robert Huebner, Karl Jeffery, Ray Muzyka, Tamra Nestler Fionda, Kathy Schoback, Eric Zimmerman

Despite the overall growth and progress of the games industry, there are countless issues and barriers that must be dealt with in order for the business of games to truly succeed. While there is no question that studios are in this business to make great games, be competitive and prosper, there are meta-level business issues that affect us day-to-day that we need to come together as a community and deal with or at least explore.

This Think-Tank provides a rare opportunity for studio heads, publishing executives and other industry leaders to come together in a neutral forum, roll up their sleeves and work out solutions to some of the biggest issues facing game development studios today:

-Developer/publisher relations
-Contracting and negotiation practices
-Risk aversion and original content
-Intellectual property rights
-Funding and cash-flow management
-Alternative business models
-Corporate strategy and long-term planning
-Retail and consumer relations
-Perceptions within the greater business community
-Hiring and quality of life practices

These issues, and more, are explored and discussed in a pragmatic manner. The outcome is a mutual understanding of the business issues facing developers and possible solutions that can be implemented to overcome them.

Idea Takeaway

Attendees leave the Think-Tank with a wealth of ideas on how to run their companies better and overcome some of the big-picture issues they deal with on a daily basis. The goal is to improve the industry by empowering developers with needed knowledge.

Intended Audience/Prerequisite

This is an advanced, expert level program. The Think-Tank is intended for industry veterans managing game development studios, publisher executives and other industry leaders who care about the strength and future growth of their companies and the game development community. Also, attendees are expected to become actively involved and contribute during the group work exercises.

▶ (353) • GAME TUNING WORKSHOP

Marc LeBlanc

This intensive two-day workshop explores the concept of tuning in-game design. Through hands-on activities, group discussion, analysis and critique, attendees immerse themselves in the iterative process of refining a game design and discover formal abstract design tools that help them think more clearly about their designs and make better games.

Game design is an iterative process. In any medium, the final quality of a game depends on many cycles of experimentation, analysis and revision, also known as tuning. This tuning process is the focus of the workshop. It presents a formal approach to game design, in which games are viewed as systems, and analyzed in terms of their Mechanics, Dynamics and Aesthetics.

Before we can even begin to design a game, we need to understand our aesthetic goals. In other words, we need to enumerate all the kinds of "fun" that we hope the game provide its users. We can formalize our understanding of our game's aesthetic goals by formulating an aesthetic model for each goal, a formal description of the goal that identifies its criteria for success and possible modes of failure. The workshop presents a handful of aesthetic models as examples, and also encourage attendees to formulate their own. Attendees use game design exercises to practice using aesthetic models as a yardstick to measure their progress through the tuning process.

Working in small groups, attendees are given specific games to play and analyze them in terms of aesthetic goals and models. Several different games are explored, and common game design themes are identified as different groups share their results. For each game that they analyze, attendees are presented with a concrete design exercise to undertake. An exercise might involve adding a new feature, accommodating a new goal or requirement, or fixing a design flaw. These exercises challenge attendees to analyze and identify the design principles at work in a game, and to think flexibly and creatively while working within design constraints. In addition, these exercises serve as a starting point for discussing how the tuning process applies to games in digital and non-digital media.

In addition to these analysis-and-revision exercises, attendees gain further practical experience working with these models through brief collaborative design projects, brainstorming sessions, critical analysis and discussion.

Idea Takeaway

Game designers and programmers leave this workshop with new abstract tools for analyzing and improving their own game designs, a deeper understanding of iterative design, and other lessons that emerge from the small group discussions with their peers.

► **(109) • HOW TO WRITE AN UNFORGETTABLE STORY**
John McLean-Foreman

Traditionally, good storytelling has been given low priority in videogames. There is a certain logic to this as it is the gameplay that makes a game, not the story. What the story does however, is that it gives the gameplay a purpose beyond repetitive hacking and slashing, and collecting power ups. A good story, properly used, will make a good game great, and a great game legendary. To become a master storyteller takes years of study and practice. This is just the beginning.

The one day tutorial covers:
- Designing protagonists and antagonists
- Character arcs
- Show, don't tell: avoiding undramatized exposition
- How to study and replicate sharp dialogue
- The importance of: Research
- Destroying cliché
- Establishing ideas: making the impossible believable
- The use of backstory: creating a realistic world
- Film study: How to analyze scenes from movies
- Opening game cutscenes: bad vs. good
- Dramatic choice
- How to create emotional responses in players
- Creating the illusion of choice in a linear game

Idea Takeaway
A keen interest in the mechanics of storytelling and a willingness to participate in discussions.

Intended Audience/Prerequisite
Participants are not only gaining an understanding of the basic building blocks of what makes a great story, but more importantly, they know whether they want to dedicate the time required to master the art of storytelling.

► **(331) • PLAYTESTING STRATEGIES**
Michelle Gamboa, Ray Kowalewski, Prodipto Roy

When balancing a game, usually designers and testers find that changes that look good on paper, do not work in actuality. Moreover, often a change that accomplishes what it was intended to will have impact in areas it was not. Different game types require different strategies for play balance. The purpose of this class is to discuss different game types in abstract and how to balance them, followed by drilling down on specific games. This tutorial helps identify what to play balance, how to draw the most from playtest results, and what differences exist in balancing games of different genres and platforms.

Idea Takeaway
Attendees learn how to drill down on a game to identify what to look for when play balancing. They learn strategies for balancing specific game types, as well as methods for gaining the most useful information from playtest results. Time is allowed to discuss and brainstorm on balancing specific games.

Intended Audience/Prerequisite
This tutorial is for game designers or testers who are responsible for or interested in play balancing games.

► **(333) • CREATIVITY BOOT CAMP**
Paul Schuytema

The Creativity Boot Camp is an immerseive day of high-energy work with one goal in mind: to hone your most vital and important piece of software—your creative mind. This tutorial lays the groundwork by exploring your mind, your creative intelligences and the "care and feeding" of your gray matter. The bulk of the day is spent in high-energy exercises that focus on exercising your creative muscles and then applying those muscles to the all-important tasks of game design and game visualization. Attendees explore creative-calisthenics that will improve the functioning of their own creative mind, as well as the functioning of the "hive mind" (team-based creative work). Participants also work through a series of RRD (Rapid Result Designing) exercises, both individually and in small teams, which will enable them to see how a nimble creative mind can truly enhance the design and development process. While the subject of this tutorial is creativity, the approach is practical and is focused on delivering tools and understanding to the participants so they can leave the session with new skills that they can put to work immediately, not just abstract concepts.

Idea Takeaway
The takeaways from this tutorial are:
- A working understanding of how the creative mind works and how to maximize its potential physiologically;
- A set of techniques and exercises aimed at enhancing the performance of one's own creative intelligence;
- Techniques and exercises to utilize creative firepower in the realm of game design and development, both in the realm of individual design and group design and planning;
- "Screamsheets", short documents covering the key issues in the tutorial, designed for easy reference later.

Intended Audience/Prerequisite
This tutorial presents tools and techniques aimed at the game design process. Game designers are the primary audience for this tutorial, but the tutorial is also geared to development teams who think, plan and brainstorm in small to medium sized groups (which could included producers, content creators, programmers, writers, etc.).

► **(336) • GOODBYE POSTMORTEMS, HELLO CRITICAL STAGE ANALYSIS**
Wolfgang Hamann

What is a postmortem? A cynical definition might be: a common artifact of the game development process whereby the game industry documents the fact that everyone seems to continuously make the same mistakes. The typical process starts at or near the completion of the project. Someone on the team gathers information on what happened over the past 18 months or so. Why is it done? Seemingly to not repeat the same mistakes in the next game. However, a review of postmortems on Gamasutra.com reveals the same or similar mistakes are made over and over again. Why? What is the point? The recommendation? Change the process. Get rid of postmortems entirely. It's time to consider Critical Stage Analysis or CSA. The CSA process provides a quick, relatively painless process to find out what went right, what went wrong, what needs to be done to fix it, who will do it and by when. CSA was introduced at GDC 2003 and this is the workshop version.

Idea Takeaway
A full understanding of the CSA process and the management skills required to implement it.

Intended Audience/Prerequisite
Producers, project managers, team leads, senior executives or anyone moving in that direction. Prerequisites for attendees is to have shipped or are shipping at least one title.

► **(337) • ADVANCED VISUAL EFFECTS WITH DIRECT3D**
Leigh Davies, Jeff Grills, Richard Huddy, Jason Mitchell, Gary McTaggart, Alex Vlachos

Brought to you with the collaboration of the industry's leading hardware and software vendors, this day-long tutorial provides an in-depth look at the Direct3D technologies in DirectX 9 and how they can be applied to cutting-edge game graphics. After a review of the latest API improvements and shader models, a variety of special effects which illustrate their use in game content is discussed and demonstrated. This includes detailed presentations from ATI and Nvidia's demo teams as well as top game developers who ship real games into the marketplace. In addition to illustrating the details of rendering advanced real-time visual effects, this tutorial covers a series of vendor-neutral optimizations that developers need to keep in mind when designing their engines and shaders.

Idea Takeaway
Attendees gain greater insights into advanced utilization of the DirectX 9 graphics APIs as used in popular shipping titles.

Intended Audience/Prerequisite
The intended audience for this session is graphics programmers who are actively developing a DirectX 9 application.

► **(338) • ESSENTIAL MATH FOR GAME PROGRAMMERS**
Lars Bishop & Jim Van Verth

Anyone who has visited his or her local mall lately should know that the majority of today's games are done in 3D. Programming for these games requires a higher level of math background, not only to do graphics but also for such "new growth" areas as simulation and AI. This tutorial provides a toolbox of techniques for programmers interested in improving their 3D background, with references and links for those looking for more information. The focus of the course is to follow the rendering and dynamics pipelines and show how problems along the way can be solved and optimized using 3D mathematical concepts. Topics include numerical techniques, affine transformations and model manipulation, introduction to scene graphs, camera tracking, projective transformations, basic rasterization and texturing, curves and interpolation, quaternions, collision detection and picking, basic simulation and collision response. Sample code libraries and examples are provided.

Idea Takeaway
After taking this tutorial, attendees should have a core background in the mathematics necessary for graphics and simulation, so that they can contribute constructively towards development of a game in a 3D environment.

Intended Audience/Prerequisite
This tutorial is primarily for those who wish to improve their math abilities or fill some holes in their background. Freshman calculus and an understanding of vectors and matrices is expected.

► **(341) • WEB-BASED 3D GAMING**
Wyeth Ridgway, Gary Rosenzweig, Doug Twilleager, Jules Urbach

Web games have graduated from clones of 80s favorites to more hardcore 3D games. A variety of technologies extend browsers to allow developers to quickly and cheaply create 3D games that almost anyone with an Internet connection can play. This tutorials review technologies like Shockwave 3D, Groove3D, Wild Tangent and others. Their strengths and weaknesses are examined and examples shown. Part of the day shows an example of a 3D game built in Shockwave 3D, made with Macromedia Director. Code is shown and shared.

Idea Takeaway
Attendees learn which 3D technology is best for them. They see what it takes to make a web-based 3D game. They get an idea of where web-based games are headed.

Intended Audience/Prerequisite
Prerequisite knowledge is not required. Shockwave coders get more from the example code, but all gain a knowledge of 3D web technologies that help them make decisions and initiate projects.

► **(346) • HUMAN RESOURCES FORUM: TRENDS AND DIRECTIONS**
Hank Howie & Clarinda Merripen

Between 75-90% of all incurred development expenses go towards the compensation and benefits of the artists, designers, programmers and administrators that create games. The management of human capital should be paramount in the business strategy of developers, yet human resources and a comprehensive people strategy are often only addressed when problems arise.

The world of human resources is rapidly changing. No longer can it be handled by the secretary at the front desk who is "good with people." A good HR department or person, for that matter, needs to be a true business partner: aware of the impact on the bottom line and empowered to achieve the desired ends. As just one example, the first two weeks of orientation can heavily determine the productivity of a new employee over his or her next year of employment. Increasing the depth of that orientation can more rapidly increase productivity, thus directly increasing performance within a short amount of time. Another example is recruitment. Even a "low-level" bad hire can cost a company hundreds of thousands of dollars lost in time, legal issues, severance and lost knowledge.

Developers are finally beginning to understand the link between quality of life issues and their relation to the bottom line. As the industry grows up, many developers are struggling with work-life balance issues such as overtime, elder care, and family needs. The stereotype of an 'ideal' programmer who works 90 hours a week and sleeps under her or his desk is being replaced with the more reality-based image of an under-performing programmer whose work habits create lots of buggy code, who can be difficult to deal with and may just end up leaving after a year.

In response, the IGDA, in conjunction with the GDC, is taking a day to focus on Human Resources in the game industry. We focus on defining the needs of the industry, looking at areas for improvement and studying and integrating business with HR.

► **(350) • THE ART OF MODELING AND ANIMATING TRIPLE A TITLES IN MAYA**
See www.gdconf.com for more info.

Hit games now demand a much broader range of animation, all of it hero-character quality. Hits require more geometry, and that means larger levels and far more objects. So, when the art assets are exported to the engine, animation sequences, levels and level objects run smoothly at 60 frames per second without stuttering or popping. With the help of Maya experts from game developers and Alias you will learn proven approaches for creating award-winning results.

Idea Takeaway
An understanding of the key animation tools in Maya for creating and mixing clips and editing mocap. An understanding of the latest techniques for building large levels and pre-baking lighting for them. New tools for artists to generate hardware shaders will also be explored. An understanding of how leading game developers are applying these tools and workflows to create industry leading animation and levels.

Intended Audience/Prerequisite
3D artists, who use Maya daily, or are considering it, who want to tap the full power of Maya for creating game art.

ONE DAY TUTORIALS • TUESDAY, MARCH 23

▶ **(211) • Do-it-Yourself Usability: A Crash Course on User-Testing**
Tom Lorusso & Marcos Nunes-Ueno

What helped make the aiming model in Halo work so well? How did the Dungeon Siege team solve many 3-D camera issues? What helped make the mouse-flight controls in Freelancer fun and easy to use (despite the consternation of many joystick jockeys)? These products used usability testing to help solve these (and many other) design issues. User-testing has long been used by other industries. Producers of products as disparate as automobiles, home appliances, consumer electronics, productivity software and web design have all used user-testing to improve their products and outperform their competitors. Traditionally, products in these industries have needed to become easier to use as their markets grew from groups of hard-core professionals and enthusiasts to wider audiences of less technically savvy and more casual users. Until recently, few game developers have incorporated systematic user-testing feedback into the development cycle. As the game industry continues to mature and reach wider audiences, ease of use will become another important differentiator consumers will demand when choosing between competing products. And members of the game industry, quick to capitalize on any competitive advantage, are beginning to take note; numerous attendees at last year's Making Games More Fun: Methods for Play-Testing Games, taught by Bill Fulton and Michael Medlock, requested a tutorial on usability testing. The Games User-testing Group heard their pleas and now present a crash course on usability testing methods employed by Microsoft Game Studios.

This tutorial covers all major aspects of a technique used by usability professionals: the usability test. All major steps involved in conducting usability tests are covered, including designing and setting up usability tests, running participants, analyzing data, and reporting results.

Attendees learn how to adapt professional usability techniques to run quick and effective usability tests that produce reliable and actionable results. Presenters use a combination of presentations, illustrative examples from the game industry, hands-on exercises and small-group activities to teach attendees how to use usability tests to improve their games. For more information about the Games User-testing Group at Microsoft Game Studios, please refer to www.microsoft.com/playtest/publications.

Idea Takeaway

In this tutorial, attendees learn how to conduct a usability test from start to finish. Attendees learn what a usability test is, how to design and set-up a usability test, how to set up a usability "lab", how to recruit and run participants, how to gather useful data and analyze the data, and how to report findings from the usability test to the rest of the team.

Intended Audience/Prerequisite

This tutorial is intended for those who are interested in learning how to use systematic user feedback to improve their game.

▶ **(332) • Game Design: the 100 Year Summit**
Katie Salen & Eric Zimmerman

What are the great, unsolved problems of game design? What are the major advances in our field and who will be bringing game design into the dawning century? Taking a cue from David Hilbert's famed 1900 lecture to the International Congress of Mathematicians in Paris, this one-day workshop will bring together the best and the brightest game designers, game developers and game theorists to lay out an agenda and a challenge, for the future of games in the next 100 years.

Workshop attendees hear reports from the trenches, short panel presentations by high-profile speakers from the game industry and academia, that identify key questions, debates and players' concerns from a range of perspectives. These rapid-fire reports will be punctuated by work sessions in which attendees collaborate on the development of mini-manifestos that map the landscape of this century's most signifi-

cant game design problems. These manifestos embody the real goal of the workshop, which is to define the conceptual challenges of the field and strategize ways for finding solutions.

Idea Takeaway

Attendees gain a strong understanding of the current state of game design, development and theory from many points of view, with an eye toward identifying a set of game design challenges and solutions for the future of games. The ideas and materials that result from this important event are shared online and in print with the rest of the gaming world.

Intended Audience/Prerequisite

This is an interdisciplinary workshop intended for experienced game designers, game scholars, game critics, game educators and others interested in gaining a better understanding of the current state of the field. The workshop is highly participatory, so attendees should be prepared to take an active role through debate, discussion and the exchange of ideas.

▶ **(334) • Casual Games Summit**
Steve Meretzky

Casual games, those five minute games you play for a quick break and end up spending two hours with, get only a tiny share of the attention at the Conference, but they actually represent the vast majority of game play that occurs around the country and the globe. The Casual Games Summit is a comprehensive look at all things casual games-related, focusing on design issues but also covering production, business and technical issues of interest to a general audience. The differences between casual game and core game design are examined, including an analysis of the casual game audience. This tutorial covers the entire casual games space, retail, web and mobile, with guests from many different channels and disciplines, and includes copious demos of games from every casual game genre.

Idea Takeaway

That casual games are the way to reach a mass audience. The rules for casual game design, illustrated by demos of real examples from games. Analysis of the casual games audience, including age, gender and cultural issues (since casual games appeal to a much wider age range than core games, since they appeal to women in far greater percentages than core games, and because they are far easier to internationalize than core games). The casual games space is a vibrant area of game development, with numerous successful revenue channels and opportunities for entry by individuals and small companies that the core game space largely precludes.

▶ **(335) • Developing a Massively Multiplayer Game**
Raph Koster, Rich Vogel, Gordon Walton

Every year the bar keeps rising on persistent online games. These games cost more to develop, take longer to make and have team sizes approaching a 100 people. How can you midigate your risks upfront? What type of team do you need to hire? How do you efficiently manage a large team? What design decisions do you need to make in order to reduce backend costs? These are just a few of the topics we are going over in the tutorial. In general this tutorial provides an overview of the production process for persistent world games, covering lessons learned from Ultima Online, Everquest, and Star Wars Galaxies.

Idea Takeaway

The takeaway for this lecture are concrete, specific methods used to tackle various problems in massively multiplayer production; a better understanding of the implications of various production choices in online development; a sense of what type of team needs to be formed to build a MMOG; how is it different from single player game production and design considerations.

Intended Audience/Prerequisite

This is an intermediate tutorial intended for designers and producers of online worlds.

▶ (340) • ADVANCED OPENGL TUTORIAL
Simon Green

OpenGL continues to be the leading API for cross-platform 3D graphics applications. New core functionality and extensions aim to keep OpenGL at the bleeding edge of hardware functionality, while at the same time providing a stable development platform. Brought to you with the collaboration of the industry's leading graphics hardware vendors, this day-long tutorial provides an advanced look at the latest technologies in OpenGL, and how to use these technologies to make your games run faster and look better.

Idea Takeaway

Attendees takeaway how to use the latest features of OpenGL using the shading language to improve the look and performance of your games and art tools.

▶ (342) • TEST AUTOMATION IN GAME DEVELOPMENT
John Bartkiw, Jennifer Boespflug, Jonathan Burns, David Eichorn, Sean P. Jenkin

In the past, there has been a difference between automation levels in application software testing and game testing. QA/Test in application development has had automated testing for many years because of large project scopes. Game testers on the other hand have only recently seen the size and scope of games increase. There is also a difference between the purposes of these two areas of software: productivity and fun! Can automation make a game fun? No, but it can make the game more stable, confirm features work as expected and provide testing for the millions of combinations in an RTS/RPG/Fighting/ (insert genre here) game. All of this can free up team resources to either save money or spend more time on fun game balancing. This tutorial introduces the theory of automation, the benefits of automation and demonstrates that there are several types of automation that all projects can implement to save production time and money. Learn what it takes to build an end-to-end automation system and the problems that can be encountered. Find out about automating build and BVT processes, getting useful data from your automation testing and how to present those results effectively to your teams. Learn multiple techniques for interacting with a game including internal and external scripting systems, in-game hooks and the Xbox debug channel library for Xbox titles. Leave knowing how to establish a strategic, optimal, phased plan of attack for automation integration. The tutorial is presented by Microsoft Game Studios Software Design Engineers in Test and is supplemented by automation demos implemented in recent MGS titles.

Idea Takeaway

Attendees leave this presentation with a fundamental understanding of why, what, when and how to automate the testing of games. They understand that there are several types of in-game automation that are simple to implement and save most projects production time and money. Finally they can intelligently design an optimal automation plan of attack that best takes advantage of their circumstances.

Intended Audience/Prerequisite

The intended audience for this tutorial includes producers, game developers, QA testers and tool developers for all gaming platforms, including PC, Xbox, PlayStation and Gamecube. There are no pre-requisites for this tutorial as it covers theory, design, implementation and deployment of game automation.

▶ (343) • PROFESSIONAL JAVA GAME DEVELOPMENT TECHNIQUES
Dustin Clingman, Shawn Kendall, Syrus Mesdaghi

This tutorial is an introduction to the newly release Gaming APIs from Sun Microsystems. Topics include 3D Graphics, High performance audio as well as a number of critical techniques relating to performance and platform compatibility.

Idea Takeaway

The key takeaway from this session are a strong foundation in the new core Gaming APIs as well as an understanding of the challenges and benefits of utilizing Java in existing and future development cycles.

Intended Audience/Prerequisite

The core audience for this tutorial are experienced Java programmers or those looking to use Jave in current of future projects. Prerequisite knowledge in Java is preffered.

▶ (344) • CREATIVITY IN CREATURE AND CHARACTER DESIGN
Donald Seegmiller

Come and spend a day learning about creativity and how to apply it to create compelling creature and character designs. Feeling like the most creative thing you do during the day is get out of bed? This day long tutorial is the answer to get you up and out of your creative rut. In the beginning of the tutorial, it's concentrated on giving you the necessary tools to jump start creativity through a series of exercises that you can use each and every day. Some of the suggestions are cerebral in nature and some are hands-on, where you, the artist, will be drawing, so bring your art materials. After you have spent half the day learning to be creative, we jump in and put what you have learned into practice. A number of different drawing exercises designed to solve specific creature and character design issues will be tackled. Never fear, if your drawing skills are rusty. Much of the afternoon is also about improving your drawing skills. Also, in the afternoon, examples of creating, drawing and painting on the computer are demonstrated using a variety of programs. A brief discussion of different applications that can be used are presented. All in all a day of learning, creating and drawing for anyone that wants to have that magic needed to create exciting creatures and characters.

Idea Takeaway

Attendees gain an increased understanding of creativity and how to use it; mental exercises that help increase your creativity; drawing exercises that you can use to increase your creative ideas; increased drawing and sketching skills; an increased knowledge of different computer applications and how they can be used in your creature creations.

Intended Audience/Prerequisite

This session is for artists who love to draw, want to improve their skill, and be more creative while doing so. The only prerequisite is a love of drawing and sketching and bringing your own materials to participate. Less experienced artists benefit the most.

▶ (347) • Audio Boot Camp
Scott Selfon & Dave Ranyard

This tutorial attempts to explain major audio concepts in language suitable for composers, sound designers, programmers and game designers, in short, an opportunity to learn what concepts like "rolloff," "ADPCM," and "multi-streaming" really mean and how they are used by games. Topics include the audio production pipeline, basic sound terminology, audio resource management techniques and tradeoffs, the use of multi-channel surround sound in games, dialog production, non-linear audio, and an introduction to some of the platform-specific audio tools. There are ample opportunities for open discussion about the current state of game audio, and how audio can really add value to the gaming experience by making them more fun, realistic and immersive.

Idea Takeaway

Understanding of audio terminology and concepts, as well as key audio production pipeline challenges. The ability to start a project better knowing how to define the assets needed, obstacles to overcome and planning required.

Intended Audience/Prerequisite

Composers, sound designers, audio programmers, game designers and producers. Presentation assumes only very broad prior general knowledge regarding audio.

▶ (349) • 3DS Max Tutorial
See www.gdconf.com for more info.

▶ (357) • Leveraging Development Deals to Build Value in Your Studio
Jim Charne, Dan O'Connell Offner, Frank Pape, David S Rosenbaum, Robert Walsh

Some studios go job to job and never get anything more than a paycheck. Others find ways to build value that can lead to acquisition, outside investment and, at the end of the day, personal wealth, for the principals and senior staff. Industry lawyers and senior executives explore today's development deal marketplace to identify ways in which development studios can build value.

This tutorial reviews business models for both developers and publishers, discusses the nature and details of development agreements and focuses in on those areas that give developers the best opportunity to grow their businesses.

The program closes with a mock negotiation between a developer and publisher with discussion on strategies to retain or control rights that can help a developer grow.

Idea Takeaway

Understanding the nature and details of development deals, and identifying areas the developer can leverage to build value, is the first step to building a company with enduring value.

Intended Audience/Prerequisite

Developer executives and senior staff who have an interest in building new companies.

▶ (444) • World Building in Maya • sponsored tutorial
See www.gdconf.com for more info.

In this Tutorial, you learn the experts' tips and tricks for exploiting Maya's "graphic OS" to create powerful world building tools. During the day, Maya MEL and API experts from Alias and key game developers show ways to create artist-friendly Blind Data and Dynamic Attribute managers, how to create an exporter/importer suited to the needs of your workflow and how to create and tweak hardware shaders.

Idea Takeaway

Attendees takeaway an understanding of the approach and benefits of tight integration of Maya into the pipeline. Examples of some of the most commonly needed, yet most powerful plugins are presented.

Intended Audience/Prerequisite

Tools team programmers who are currently using Maya or those who want to understand what Maya's API can do, and the best methods to extract maximum performance from it.

▶ Microsoft tutorial

Discover how to get the most from Windows and DirectX 9 at the Microsoft Windows DirectX Developer Day, Tuesday, March 23 at GDC 2004! Two tracks, Advanced Developer and Production, will feature presentations by Andy Glaister, Kev Gee, Craig Peeper, Dan Baker, Skip McIlvaine, Dave Aronson and more! Register now and learn:

- What's in the next DirectX SDK Update
- Debugging and performance tools for DirectX
- Precomputed Radiance Transfer for both devs and artists
- New shader model support for HLSL
- Tips and tricks of D3DX
- Production toolsets for artists and sound designers
- The future of DirectX technologies
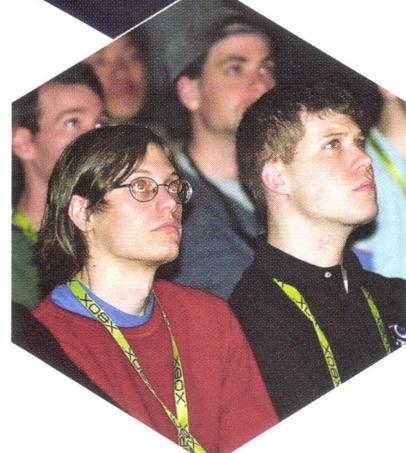
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FULL DAY SPONSORED SESSIONS

▶ **ADVANCED SHADER EFFECTS WITH ATI**

ATI

Programmable graphics shaders are now a standard feature on a wide range of graphics hardware. The introduction of the DirectX 9 and OpenGL high level shading languages has enabled a much wider audience to leverage this hardware to create compelling visual environments.

Join ATI's 3D Application Research Group for a series of presentations that take an in depth look at the state-of-the-art in programmable shader effects.

▶ **DISCREET SPONSORED SESSIONS**

discreet

- Film work with 3ds max
- 3ds max Pipeline Demonstration
- Asset Management in the Games Pipeline
- High Profile Game Development Guest Speaker
- Tips and tricks for 3ds max 6 in Game Development
- High Profile Game Development Guest Speaker
- Discreet Certified 3ds max plug-ins: Integration within the Pipeline
- Mobile Gaming and 3ds max
- Forum (Invitation only)
- SDK ->Developer Session (Beta discussion w/programmers)
- Discreet Certified Sparks – How to get in the game

▶ **HLSL HANDS-ON WORKSHOP**

Microsoft **DIRECTX**

Get your hands dirty with the wizards of Microsoft's High Level Shading Language in the DirectX Hands-on Shading Workshop, Wednesday through Friday at GDC 2004!

Get a gentle but thorough introduction to HLSL and the D3DX Effects system with the Beginner HLSL Session, or take the Advanced Shading Session to learn how to create cool effects for your game and how to use advanced real time shading techniques including:

-Tangent space lighting for bump mapping,
-Non Photo Real (NPR) shading,
-High Dynamic Range (HDR) image based lighting.

Sign up at the Microsoft booth # 818 or outside classroom C2

▶ **NVIDIA DEVELOPER TECHNOLOGY ENGINEERS**

nVIDIA

Back by popular demand, NVIDIA presents an entire day of technical sessions. Engineers from the NVIDIA Developer Technology group will address a wide range of topics including the latest API advances, the newest GPUs, stunning original effects, developer tools, and performance tuning strategies. Attendees can look forward to gaining in-depth knowledge of newest NVIDIA GPUs, with a focus on achieving optimal performance in real-world situations. Tons of original content from the brave new world of programmable shading, as well as numerous new tools and techniques, make attendance at these sessions required for the serious real-time developer.

▶ **TRYMEDIA SYSTEMS SPONSORED TRACK: SECURITY**

TRYMEDIA SYSTEMS

A full day of keynotes and workshops dedicated to the latest game security challenges and the best methods of game protection. Security experts expose the 'hacker mindset' and provide tips on how to save time and avoid costly integration and other pitfalls. Fellow game developers will share case studies and experiences. The Security program track closes with in-depth tutorials designed to optimize your developer and end-user experiences with the most powerful game protection available. For free advance registration go to www.trymedia.com/gdc04/.

▶ **XBOX DEVELOPER TRAINING**

XBOX

Join Xbox for Xbox developer training on Thursday, March 25th. This day long event will be open to everyone attending GDC 2004, not just Xbox Developers.

Ex
(Circus Maximus)

gdc expo

Companies from around the world demonstrate the most innovative tools and emerging technologies at the GDC Expo. Sponsored sessions feature leading technology vendors providing valuable hands-on instruction.

LIST OF EXHIBITORS, as of December 15, 2003

Academy of Art College
AK Peters
Alias Systems, a Division of
   Silicon Graphics
AMD
Animation Magazine
Anthro Corp
The Art Institutes
Associated Production Music
Atari
ATI Technologies, Inc.
Big World
Bitboys Oy
Blizzard Entertainment
Charles River Media
Collins College - A School of
   Design & Technology
Compulsive Creative
Computer Graphics World
Creative Labs
CRI Middleware
Criterion Software Limited
DigiPen Institute of
   Technology
Digital Artist Management
Digital Eclipse Software
Discreet, a division of
   Autodesk
Dolby Laboratories, Inc.
Corporation
DTS

Epic Games
Firelight Technologies
GameBeat Studios, LLC
GameSpy
Genemation
Gigex, Inc.
Havok
HI Corporation
Immersion Corporation
Intel Corporation
Interactive Data Visualization
IT GlobalSecure Inc.
Logitech, Inc.
LucasArts Entertainment
Majesco Inc.
Maryland State Department
of Business and Economic
   Development
Metrowerks
Microboards Technology, Inc.
Microsoft Recruiting
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   & Graphics Technologies
Microsoft Xbox
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Mobile Entertainment Analyst
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Morgan Kaufmann
   Publishers
Naturalmotion Limited
NewTek

Nintendo of America, Inc.
Nokia
Numerical Design Limited (NDL)
NVIDIA
NVIDIA Career
NXN Software
Oddworld Inhabitants, Inc.
Peach Pit/New Riders
Premier Press, a division of
   Course Technology PTR
Premier Search Inc
RAD Game Tools, Inc.
Rainbow Studios
Real Networks
Red Storm Entertainment
S3 Graphics
Sammy Studios
SN Systems Ltd.
Softimage
Sony Computer
   Entertainment America
Soundelux DMG
Storm Front Studios
Sun Microsystems, Inc.
Tapwave
Testing Testing 123
Trymedia Systems
Vancouver Film School
Vicarious Visions
Zona, Inc.

SPONSORED SESSIONS

Alias
   ▶ **Maya for Games,** Maya Team

Nokia
   ▶ **Developing Native C++ Games for Mobile Devices,** Nokia Games Team
   ▶ **Developing Games for N-Gage,** Matthias Lueck & Liam Patton
   ▶ **Creating Local Interactive Games for N-Gage,** Paul Whitaker & Jari Saarhelo

Nvidia
   ▶ **Coming to a Pixel Near You: Nvidia Goforce,** Speakers TBA

GameSpot
   ▶ **GameSpot Presents GameSpot Trax: How Much BUZZ will your Game Get?,** Vince Broady

Register by February 18 at www.gdconf.com

to save up to 30% on the price of GDC Passes

EVENTS AT GDC

GAMEHOTEL – Games & Digital Pop Culture

From Hong Kong's wildest action figure designers to MTV Best Music Award-winning directors and an all-star line-up of game visionaries from Japan, Europe, and the US, all will come together in a vibrant setting, as GAMEHOTEL plays host to an intoxicating cocktail of luminaries from inside and outside the games industry.

As a new addition to GDC, GAMEHOTEL (a highly successful event launched in Paris in 2003) spotlights the intense desire of industry players as well as a growing audience, for a rich and diverse future of interactive entertainment.

Expect a refreshing and exuberant show chock full of highlights, screenings, talks and showcases, as well as a whole lot of fun. You'll walk away from GAMEHOTEL with your brain bursting with fresh ideas and a deeper understanding of games as a driving force of today's pop culture.

Presented by TNC Network

GAMEHOTEL Guests (as of 12/15/2003):
    Tetsuya Mizuguchi
    H5
    Masaya Matsuura
    Furifuri
    Mathieu Castelli
    Designer Toy Showcase, in collaboration with Kidrobot

SCHEDULE AT A GLANCE

MONDAY MARCH 22

Registration Open 8am-4pm

Time	Event
9:00 - 10:00	
10:00 - 11:00	Tutorials/ IGDA Business Summit 10:00 - 6:00
11:00 - 12:00	
12:00 - 1:00	
1:00 - 2:00	Lunch 1:00 - 3:00
2:00 - 3:00	
3:00 - 4:00	
4:00 - 5:00	
5:00 - 6:00	
6:00 - 7:00	
7:00 - 8:00	
8:00 - 9:00	
9:00 - 10:00	
10:00 - 11:00	
11:00 - 12:00	

TUESDAY MARCH 23

Registration Open 9am-4pm

Time	Event
9:00 - 10:00	
10:00 - 11:00	Tutorials/ IGDA Business Summit 10:00 - 6:00
11:00 - 12:00	
12:00 - 1:00	
1:00 - 2:00	Lunch 1:00 - 3:00
2:00 - 3:00	
3:00 - 4:00	
4:00 - 5:00	
5:00 - 6:00	
6:00 - 7:00	
7:00 - 8:00	Game Room 7:00 - 12:00
8:00 - 9:00	
9:00 - 10:00	
10:00 - 11:00	
11:00 - 12:00	

WEDNESDAY MARCH 24

Registration Open 7:30am-6pm

Time	GDC Conference	Expo Floor	Expo Suites	Independent Games Festival
9:00 - 10:00				
10:00 - 11:00	GDC Conference Sessions 9:00 - 6:30		Expo Suites 9:00 - 6:30	
11:00 - 12:00		Expo Floor 11:30 - 6:30		Independent Games Festival 11:30 - 6:30
12:00 - 1:00				
1:00 - 2:00	Lunch & Game Theater 1:00 - 2:30			
2:00 - 3:00				
3:00 - 4:00				
4:00 - 5:00				
5:00 - 6:00				
6:00 - 7:00	Independent Games Festival & Game Developers Choice Awards Ceremony 6:30 - 9:30			
7:00 - 8:00				Game Room 7:00 - 12:00
8:00 - 9:00				
9:00 - 10:00				
10:00 - 11:00				
11:00 - 12:00				

4th Annual Game Developers Choice Awards

Honor the developers who transcended the state of the art in 2003. Started in 2000 with the idea that there is no greater honor than to be recognized by one's peers, the Game Developers Choice Awards are game development's most prized honors.

▶ Wednesday, March 24, 6:30 – 9:30pm

Sponsored by:
nVIDIA.

Presented by:
igda

6th Annual Independent Games Festival

The Independent Games Festival was established in 1998 to encourage innovation in game development and to recognize the best independent game developers. The finalist games are on display at the IGF Pavilion on the GDC Expo floor. This year's winners will be announced at the Game Developers Choice Awards ceremony.

▶ Wednesday, March 24, 6:30 – 9:30pm

INDEPENDENT GAMES FESTIVAL

Sponsored by:
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Game Theater

▶ Wednesday, March 24, 1pm

Suite Night

Network with other industry professionals while enjoying food, drink and entertainment hosted by GDC exhibitors.

▶ Thursday, March 25, 8-10pm

IGDA Annual Meeting

The IGDA is the independent, nonprofit professional association serving as the voice for the game development community. All are welcome to attend the IGDA Annual Meeting; get involved and do your part to build a stronger community.

▶ Thursday, March 25, 1:15-2:45pm

igda international game developers association

THURSDAY MARCH 25				
Registration Open 8:30am-6:30pm				
9:00 - 10:00				
10:00 - 11:00	GDC Conference Sessions 9:00 - 5:15	Expo Suites 9:00 - 6:30		GDC Mobile 9:00 - 5:30
11:00 - 12:00				
12:00 - 1:00		Expo Floor 11:30 - 6:30	Independent Games Festival 11:30 - 6:30	
1:00 - 2:00	Lunch 1:00 - 3:00 IGDA Meeting 1:15 - 2:45			
2:00 - 3:00				
3:00 - 4:00				
4:00 - 5:00				
5:00 - 6:00	Booth Crawl 5:15 - 6:30			
6:00 - 7:00				GameHotel 6:00 - 8:00
7:00 - 8:00	Programmers Challenge 6:45 - 7:45			
8:00 - 9:00	Suite Night 8:00 - 10:00		Game Room 7:00 - 12:00	
9:00 - 10:00				
10:00 - 11:00				
11:00 - 12:00				

FRIDAY MARCH 26				
Registration Open 8:30am-3:30pm				
9:00 - 10:00				
10:00 - 11:00				GDC Mobile 9:00 - 5:00
11:00 - 12:00	GDC Conference Sessions 9:00 - 6:30	Expo Suites 9:00 - 3:30		
12:00 - 1:00		Expo Floor 11:30 - 3:30	Independent Games Festival 11:30 - 3:30	
1:00 - 2:00	Lunch 1:00 - 2:30			
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10:00 - 11:00				
11:00 - 12:00				

GameDevelopers
Conference
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Conference: March 22-26, 2004
Expo: March 24-26, 2004
San Jose, CA

Priority Code: FGDM4

Register by February 18, 2004 at www.gdconf.com
to save up to 30% on GDC 2004 Conference Passes

Pass options

Register online at **www.gdconf.com** to get an additional **$25 discount** off any package
when you use your priority code on the mailing label.

Pass Dates	Features	Early Registration by February 18, 2004	On or after February 19, 2004
Classic Pass M T W TH F ○ ○ ● ● ●	• Access to any of the over 300 sessions, roundtables & keynotes • GDC Expo • Breakfast & lunch • Proceedings • All events & parties	$825 **Save $525**	$1350
Giga Pass M T W TH F ● ● ● ● ●	• One tutorial on each day on March 22-23 (or the IGDA Business Summit, Game Tuning Workshop, Serious Games Summit) • Access to any of the over 300 sessions, roundtables & keynotes • GDC Expo • Breakfast & lunch • Proceedings • All events & parties	$1250 **Save $500**	$1750
VIP Pass M T W TH F ● ● ● ● ●	• GDC Mobile, March 25-26 • One tutorial on each day on March 22-23 (or the IGDA Business Summit, Game Tuning Workshop, Serious Games Summit) • Access to any of the over 300 sessions, roundtables & keynotes • GDC Expo • Breakfast & lunch • Proceedings • All events & parties	$1575 **Save $400**	$1975
Mobile Plus Pass M T W TH F ○ ○ ● ● ●	• GDC Mobile, March 25-26 • Access to any of the over 300 sessions, roundtables & keynotes • GDC Expo • Breakfast & lunch • Proceedings • All events & parties	$1095 **Save $500**	$1595
Mobile Pass M T W TH F ○ ○ ● ● ●	• GDC Mobile, March 25-26 • GDC Expo • Breakfast & lunch on Thursday & Friday • All events & parties	$695 **Save $200**	$895
Audio Plus Pass M T W TH F ○ ● ● ● ●	• Audio tutorial • Sessions & Keynote for the Audio track only • GDC Expo • Breakfast & lunch • Proceedings • All events & parties	$625 **Save $100**	$725
Audio Pass M T W TH F ○ ○ ● ● ●	• Sessions & Keynote for the Audio track only • GDC Expo • Breakfast & lunch • Proceedings • All events & parties	$550 **Save $125**	$675
Tutorials Only Pass M T W TH F ● ● ● ● ●	• One tutorial on each day on March 22-23 (or the IGDA Business Summit, Game Tuning Workshop, Serious Games Summit) • GDC Expo • Breakfast & lunch on Monday & Tuesday • All events & parties	$550 **Save $125**	$675
Expo Pass M T W TH F ○ ○ ● ● ●	• GDC Expo • At least four introductory classes (see www.gdconf.com for details) • Limited events: Booth crawl, Exhibitor suite night only.	$150 **Save $45**	$195

Travel

GDC hotel reservations, airfare and car rental discounts go to www.gdconf.com/travel/